

# Iowa Department of Public Health



## Iowa Burden of Occupational Injury

2009-2013 Full Report

**Bureau of Environmental Health Services  
Occupational Health & Safety Surveillance Program**

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## **Executive Summary**

This report was prepared to augment the Iowa Department of Public Health *Iowa Burden of Injury 2009-2013* data report and county level data reports prepared by the University of Iowa Injury Prevention Research Center. Work-related injuries and illnesses can be prevented, and successful approaches to making workplaces safer and healthier begin with having the data necessary to understand the problem. The purpose of this report is to provide data specific to work-related injuries in Iowa using data extracted from inpatient hospital discharge data, trauma registry data, and other sources as noted.

## **Key Findings**

### **Costs**

- ⤴ Hospital inpatient charges for injury cases with workers' compensation listed as the expected source of payment (WCESP) totaled approximately \$78 million in Iowa for 2009-2013.
- ⤴ Hospital inpatient WCESP injury cases rates per 100,000 FTE decreased for 2009-2013.

### **Gender**

- ⤴ Males had more than twice the average rate of hospital inpatient WCESP injury cases compared to females (33 and 14 per 100,000 FTE respectively).

### **Race**

- ⤴ Non-white workers had an average injury rate more than twice that of white workers (58 and 23 respectively per 100,000 FTE) based on inpatient WCESP injury cases.

### **Age**

- ⤴ Individuals over the age of 75 averaged a rate of 88/100,000 FTE inpatient WCESP injury cases, with women over the age of 75 averaging 116/100,000 FTE injury cases.
- ⤴ Iowa workers age 65 or older had an occupational fatal injury rate of 32.3/100,000 FTE, which was almost three times the 10.7/100,000 FTE USA occupational fatal injury rate in the same age range.
- ⤴ Iowa workers 55 years of age or older made up 22% of the workforce, but almost 38% of the fatalities.

## **Industry**

- ⤴ Agricultural workers accounted for 5% of the workforce but 32% of the fatal injuries from 2009 through 2013. Construction workers were 6% of the Iowa workforce but 17% of the fatal injuries. Together, 11% of the average Iowa workforce from 2009 through 2013 experienced 49% of the work-related injury deaths.

## **Urban, Rural, Farm, Non-Farm**

- ⤴ Rural worker populations accounted for 52% of inpatient WCESP injury cases, but only represented 43% of Iowa's population.
- ⤴ Urban worker populations (64%) suffered from a higher proportion of fractures requiring inpatient care compared to rural worker populations (58%), while rural worker populations (8%) suffered from a higher proportion of burns requiring inpatient care compared to urban worker populations (5%).
- ⤴ Urban worker populations were more likely to be involved in a fall (43%) or transportation incident (18%) requiring inpatient care compared to rural worker populations (38%, 13%).
- ⤴ Fractures (40%), open wounds (19%), contusions or superficial injuries (10%) and internal injuries (10%) were the leading farm-related work injuries identified in the Iowa Trauma Registry.
- ⤴ Fracture injuries were higher in non-farm-related work injuries (47%) than farm-related work injuries (40%) by type of injury percentages.
- ⤴ Urban worker populations had a 4 times greater percent of inpatient WCESP injury cases related to homicide or violence events (1.5%) compared with rural worker populations (0.3%).
- ⤴ Open wound farm-related work injuries (19%) were slightly higher than non-farm-related work injuries (13%) by percentage of type of injury.
- ⤴ Contusion or superficial injuries were almost twice as high in farm-related work injuries (10%) than non-farm-related work injuries (6%) by percentage of type of injury.

## **Diagnosis**

- ⤴ Fractures were the leading admitting diagnosis (61%) for inpatient WCESP injury cases.
- ⤴ The State of Iowa averaged 29 work-related traumatic brain injuries per year based on hospital inpatient WCESP injury cases.

- ⤴ Open wound injury rates per 100,000 FTE decreased approximately 20% from 2009 through 2013 based on hospital inpatient WCESP injury cases.

### **Causation**

- ⤴ Falls (53%) and transportation incidents (25%) accounted for more than 75% of all traumatic brain injuries requiring hospital inpatient care per WCESP injury cases.
- ⤴ Falls (45%) and transportation incidents (17%) accounted for 62% of hospital inpatient WCESP injury cases.
- ⤴ Transportation injury inpatient rates for workers increased by nearly 30% for the years 2009-2013.
- ⤴ Fire, flame, or explosion injury inpatient rates for workers dropped by nearly 50% from 2009 through 2013.
- ⤴ Fall injury inpatient rates for workers decreased almost 9% from 2009 through 2013.
- ⤴ Natural or environmental injuries are a higher percentage of farm-related work injuries (12 %) than non-farm-related work injuries (<1%).
- ⤴ Fall injuries are a higher percentage of non-farm-related work injuries (38%) than farm-related work injuries (20%).

## List of Acronyms

ADPER-EH .....	Acute Disease Prevention, Emergency Response & Environmental Health
BLS .....	U.S. Bureau of Labor Statistics
CDC .....	Centers for Disease Control and Prevention
CFOI.....	Census of Fatal Occupational Injuries
CPS .....	Community Population Survey
EHS .....	Environmental Health Services
ELF.....	Employed Labor Force (data resource)
FTE .....	Full-time equivalent
HHS .....	U. S. Department of Health and Human Services
ICD-9-CM.....	International Classification of Diseases, Ninth Revision Clinical Modification
IDPH.....	Iowa Department of Public Health
IPRC.....	Injury Prevention Research Center
ITR.....	Iowa Trauma Registry
NASI .....	National Academy of Social Insurance
NCIPC .....	National Center for Injury Prevention and Control
NIOSH.....	National Institute for Occupational Safety and Health
OHI .....	Occupational Health Indicators
OHSSP .....	Occupational Health and Safety Surveillance Program
SOII.....	Survey of Occupational Illnesses and Injuries
TBI.....	Traumatic Brain Injury
U.S.....	United States of America
UI.....	University of Iowa
USA.....	United States of America
WCESP .....	Workers' Compensation listed as Expected Source of Payment
WISQARS.....	Web-based Injury Statistics Query and Reporting System

## **Burden of Occupational Injury Full Report**

### **Background**

In 2008 the Iowa Department of Public Health (IDPH) partnered with the University of Iowa Injury Prevention Research Center (UI IPRC) to produce Iowa's first *Burden of Injury in Iowa* report using data from 2002-2006. The report provided statewide rates for fatal and non-fatal injuries, as well as county level reports and is available at [IDPH Disability Injury Violence Prevention web page](#). In 2016 work began on updating the report using 2009-2013 data.

*The Burden of Injury in Iowa* reports have been used extensively by both local health departments and agencies to prioritize injury programs and promote the need for injury prevention throughout the state. Distribution of cause, intent, and type of injuries varies greatly throughout the 99 counties of Iowa, depending on the population demographics and other factors. County level reports for 2002-2006 and for 2009-2013 can be found at the University of Iowa College of Public Health [Injury Prevention and Research Center website](#).

The 2008 *Burden of Injury in Iowa* report did not include data analysis detailing findings related to occupational injuries. For the 2016 report, the data was further analyzed to provide a look at the burden of occupationally-related injury in Iowa. The findings of the occupational injury analysis have been released in two formats, a full report and a shorter summary report. This *Iowa Burden of Occupational Injury 2009-2013* full report includes detailed tables, additional Iowa Trauma Registry data analysis, Iowa Occupational Health Indicator data, and expanded information regarding references, methodology and limitations. Both the summary and full reports are available on the IDPH Occupational Health and Safety Surveillance Program webpage, along with additional program information: <https://idph.iowa.gov/Environmental-Health-Services/Occupational-Health-and-Safety-Surveillance>.

Capturing comprehensive data regarding occupational injuries in Iowa can be difficult. Whether or not an injury was related to work activities may not be indicated or coded in the inpatient hospital discharge or trauma registry data sets utilized for the Burden of Injury reports. It can be impossible to tell from coded diagnostic data if a broken leg occurred because of a fall from a ladder while cleaning out gutters at home or from a fall from a ladder on a construction site, especially if the data coding is limited or incomplete.

## **Methods and limitations**

Data used for this report includes data collected as Iowa Inpatient Hospital Discharge (IHD), the Iowa Trauma Registry (ITR), and IDPH OHSSP Occupational Health Indicator (OHI) calculations.

One of the few ways to utilize these existing data sets for occupational injury data is to query for those cases listing 'workers' compensation' as the 'expected source of payment.' This method is utilized nationally to provide injury surveillance data reporting, although it has many known limitations. For this reason, the findings of this report most likely represent an under-estimate of the true burden of occupational injuries in Iowa.

The 2009-2013 Iowa inpatient hospital discharge dataset used for the full Burden of Injury report was further analyzed to report occupational injury data. Cases listing "workers' compensation" as the "expected source of payment," which will be referenced as WCESP in this report, were used for numerator counts to calculate rates for the following sections within this report: demographics, admitting diagnosis and external cause of injury, traumatic brain injuries (TBI), urban versus rural patient residence, and 3-year rolling average trends. When records are coded fully, the coding provides information regarding the external cause of the injury, the location type where the injury occurred (farm, office, highway, factory, etc.), and the intention behind the injury (unintentional, intentional, etc.). Incomplete coding of the hospital inpatient discharge data limits its use for work-related injury analysis.

It should be noted that other methods are used to monitor occupational injury and illness in the state and nationally. Non-fatal occupational injury and illness estimates reported by the U.S. Bureau of Labor Statistics (BLS) in the Survey of Occupational Injuries and Illnesses (SOII) are based on employer reporting of recordable injuries and exclude all work-related fatalities as well as nonfatal work injuries and illnesses to the self-employed; to workers on farms with 10 or fewer employees; to private household workers; to volunteers; and to federal government workers. The BLS partners with state programs to identify and report fatal occupational injuries through the Census of Fatal Occupational Injuries or CFOI. Other data sets being utilized may include workers' compensation records, emergency department and outpatient records, and private insurance data. Each data set has limitations and strengths for providing a comprehensive report of occupational injury and illness in Iowa.

All admitting diagnoses and TBI information were grouped together using ICD-9-CM codes in accordance with the Barell Injury Diagnosis Matrix (see appendix). All rates using full-time equivalent (FTE) data as the denominator were calculated using information from

the National Institute for Occupational Safety and Health (NIOSH) Employed Labor Force (ELF) query tool to provide the denominator for employed worker population estimates. The "All Jobs FTE" option was chosen to count worker hours for both primary and secondary jobs. Worker estimations were then created individually for the years 2009-2013 giving us information on sex, race, and 5-year age groupings. A 5-year average of these estimates was calculated and is shown in Appendix Table OH-B. This same process was performed to obtain worker estimates for calculation of 3-year rolling average trends, and is presented in Appendix Table OH-C and Table OH-D.

2009-2013 numerator data used for the work-related farm injuries section was obtained through the Iowa Trauma Registry. The Iowa Trauma Registry (ITR) is not population based; therefore only percentages were calculated instead of rates. Work-related farm injury data was extracted from the ITR database first with a query regarding injuries where 'yes' had been reported to the question of work-relatedness. Work-related injury data was then separated further using the data element responses of 'yes' or 'no' regarding whether the incident was farm-related. All data elements for both queries with values missing, not applicable, or unknown were not included in the analysis.

The ITR dataset does not capture injuries for workers treated outside of Iowa, treated by emergency medical services on site only, treated in emergency departments without hospital admission, or those treated by medical provider in clinics and offices. Injuries not captured using the workers' compensation filter are also missing. Because of this, the findings do not represent all work-related injuries in Iowa.

### **Work-Related Data Surveillance Limitations related to using WCESP**

- OHSSP used the same 2009-2013 Iowa Inpatient Hospital Discharge (IHD) injury dataset used for the full Burden of Injury report. Workers' compensation as the expected source of payment (WCESP) was chosen as the query to determine work-related injuries because:
  - IHD rarely contained employer identification.
  - IHD was rarely coded (2009-2013) to indicate if injury was work-related.
  - IHD was not coded for industry and occupation of worker.
  - IHD did show some external cause of injury or "e-codes" for nature of injury but not place or location of event.
- Query: Expected source of payment
  - If workers' compensation was listed, it was assumed that the injury occurred while working.

- 91% of Iowa workers were estimated as being legally required to be covered by workers' compensation per National Academy of Social Insurance data. The number of workers actually covered by workers' compensation is unknown.
- Worker injury data for workers covered by an employer that is self-insured rather than using a workers' compensation insurer should be captured using this query, but it is unknown how valid that assumption is at this time.
- It is acknowledged that this report represents an under-reporting of occupational traumatic injury in Iowa.

### **Iowa Work Force Denominator Data**

Denominator data for this report is based on Iowa work force data, or the number of workers at risk of injury. A number of decisions were made when deciding what number to use as the denominator for rate calculations or comparisons. Below are some of the factors that were taken into consideration.

- Options to consider: Count Bodies (Number of Workers)
  - Workforce: employed & unemployed
  - Private sector, government sector, all
- Options to consider: Count Full-time Equivalent Workers (FTEs)
  - Based on number of hours worked
    - 1 worker @30 hours + 1 worker@10 hours = 1 FTE, 2 workers
    - 1 worker @40 hours = 1 FTE, 1 worker
- Options to consider - which jobs to include: Primary, Secondary, All jobs
- Options to consider - which data source to use: Census, Community Population Survey, Other
  - Slightly different numbers are obtained dependent of which data source is used

Data tables and figures include information regarding what choices were used for particular data calculations. Unless stated otherwise, the denominator used was the

estimated FTE for all workers 16 years of age or older in all jobs, as determined using the National Institute for Occupational Safety and Health (NIOSH) Employed Labor Force (ELF) data query tool, which utilizes data from the Bureau of Labor Statistics (BLS) Community Population Survey (CPS).

**Table 1: Number of Iowa Workers**

	2009	2010	2011	2012	2013
<b>1 Job</b>	1,443,014	1,430,488	1,436,842	1,445,192	1,474,864
<b>2 or more jobs</b>	145,236	140,182	125,677	119,902	126,376
<b>Total Workers</b>	<b>1,588,250</b>	<b>1,570,670</b>	<b>1,562,519</b>	<b>1,565,094</b>	<b>1,601,240</b>

**Table 2: Number of Iowa Full-Time Equivalent Workers, All Jobs**

Job Hours Worked	2009	2010	2011	2012	2013
<b>1 to 4</b>	1341	1336	1207	1205	1234
<b>5 to 14</b>	21107	20774	19198	17461	18623
<b>15-29</b>	128143	115036	109183	102525	111567
<b>30-34</b>	132145	104032	109299	93765	93019
<b>35-39</b>	108125	105220	111515	105787	97275
<b>40</b>	484816	503995	502125	548441	565410
<b>41-48</b>	193364	216410	210705	194780	208142
<b>49-59</b>	213272	226944	233617	231456	233847
<b>60+</b>	210923	194777	205373	214163	213371
<b>Total FTE Workers:</b>	<b>1,493,236</b>	<b>1,488,524</b>	<b>1,502,222</b>	<b>1,509,583</b>	<b>1,542,488</b>

**Table 3: Number of Iowa Workers compared to Iowa Worker FTEs**

	2009	2010	2011	2012	2013
<b>Workers All Jobs</b>	1,588,250	1,570,670	1,562,519	1,565,094	1,601,240
<b>FTEs All Jobs</b>	1,493,236	1,488,524	1,502,222	1,509,583	1,542,488

Data Source for Tables 1-3: NIOSH ELF Estimates, BLS Community Population Survey Data

## Hospitalized Inpatient Injury Data

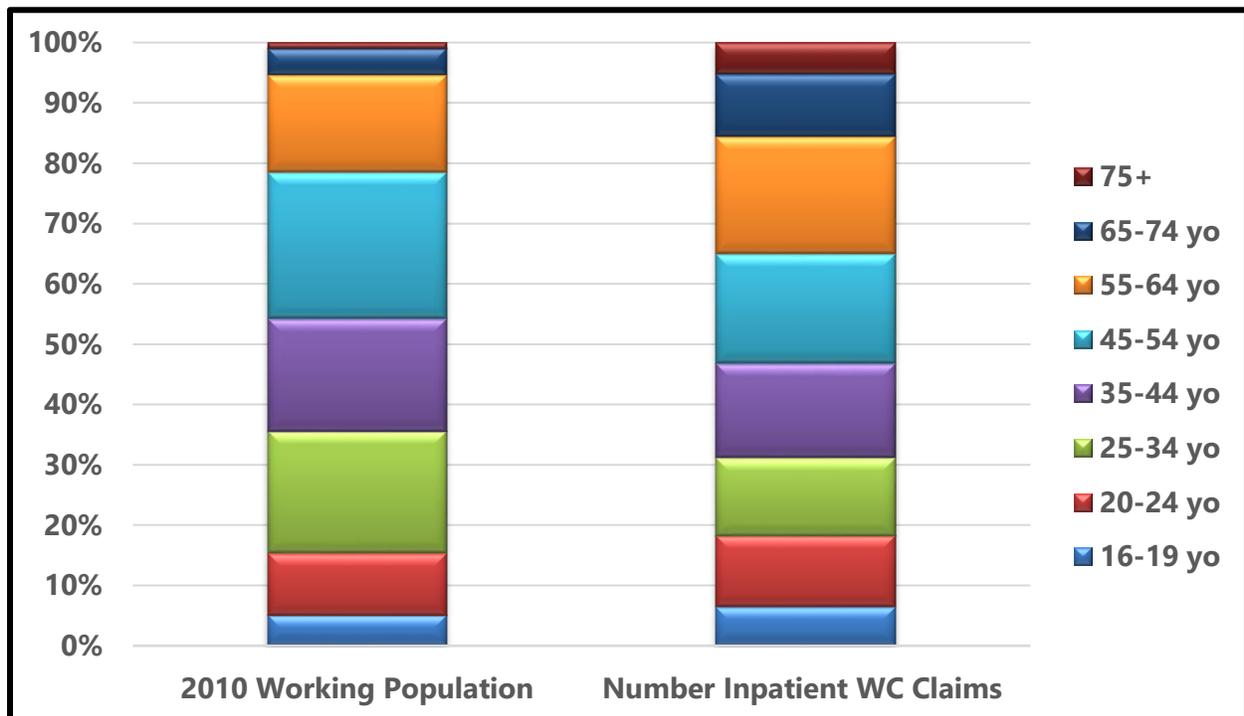
Numbers from hospital discharge data where Workers' Compensation was listed as the Expected Source of Payment (WCESP).

### Demographic-based analysis

**Table 4: Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013, Numbers by Age Group, Gender, and Race**

Worker Age (years)	Total Claims	Male Claims	Female Claims	Race	Number of Injury Claims
16-19	32	24	8	<b>White Total</b>	<b>1642</b>
20-24	135	121	14	Male	1233
25-34	288	250	38	Female	409
35-44	297	254	43		
45-54	459	357	102	<b>Non-White Total</b>	<b>239</b>
55-64	479	302	177	Male	186
65-74	147	88	59	Female	53
75+	44	23	21		
<b>Total</b>	<b>1881</b>	<b>1419</b>	<b>462</b>	<b>Total</b>	<b>1881</b>

**Figure 1: Iowa Working Population (2010) compared to Inpatient Hospital Discharge WCESP Injury Cases by Age Group (2009-2013)**



**Table 5: Five-Year Average Number of Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013, with Crude Rates per 100,000 Full-time Equivalent Workers (FTE), by Age Group, Gender, and Race**

2009-2013	Five Yr. Average Number			Crude Rate per 100,000 FTE		
Age (years)	Total	Male	Female	Total Rate	Male Rate	Female Rate
16-19	6.4	4.8	1.6	17.07	24.01	9.14
20-24	27	24.2	2.8	20.15	35.14	4.30
25-34	57.6	50	7.6	18.36	27.69	5.71
35-44	59.4	50.8	8.6	18.77	27.99	6.37
45-54	91.8	71.4	20.4	24.37	34.02	12.23
55-64	95.8	60.4	35.4	35.67	40.13	29.98
65-74	29.4	17.6	11.8	58.65	59.01	58.13
75+	8.8	4.6	4.2	87.77	71.74	116.20
<b>Total</b>	376.2	283.8	92.4	24.96	33.49	14.01
Race	Total	Male	Female	Total Rate	Male Rate	Female Rate
White	328.4	246.6	81.8	23.06	30.79	13.12
Non-White	47.8	37.2	10.6	57.66	79.74	29.24
<b>Total</b>	376.2	283.8	92.4	24.96	33.49	14.01

**Figure 2: Inpatient Hospital Discharge WCESP Injury Cases by Gender, Crude Rate per 100,000 FTE, 5-Year Average, 2009-2013**

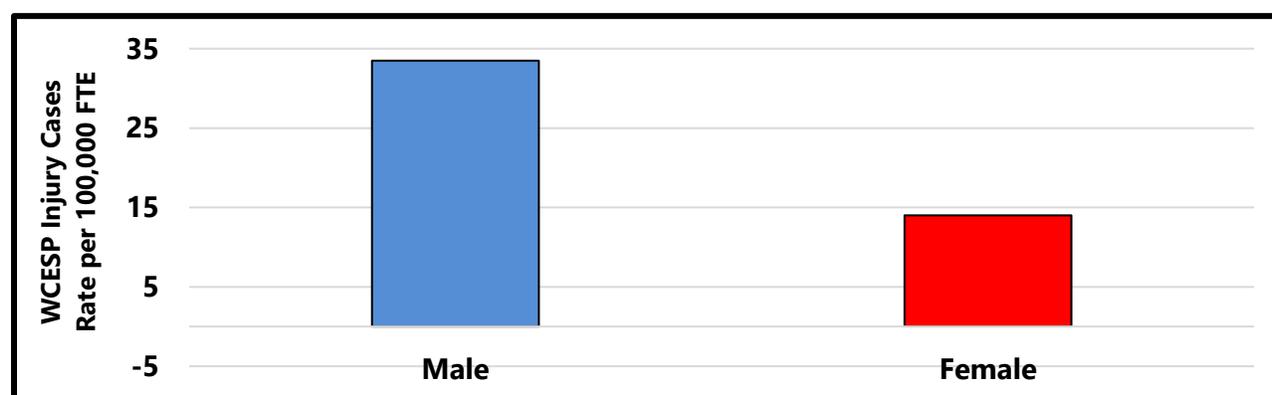


Figure 2: Males represent 52% of the Iowa workforce compared to 48% female workers (average 2009-2013) but accounted for 75% of the workers' compensation injury cases requiring inpatient hospitalization. Male gender itself is not a risk factor but an indicator of an undetermined difference in hazardous exposures between males and females. It is known that males traditionally have outnumbered females employed in hazardous occupations and industries.

**Figure 3: Inpatient Hospital Discharge WCESP Injury Cases by Age Group- Overall Crude Rate per 100,000 FTE, 5-Year Average, 2009-2013**

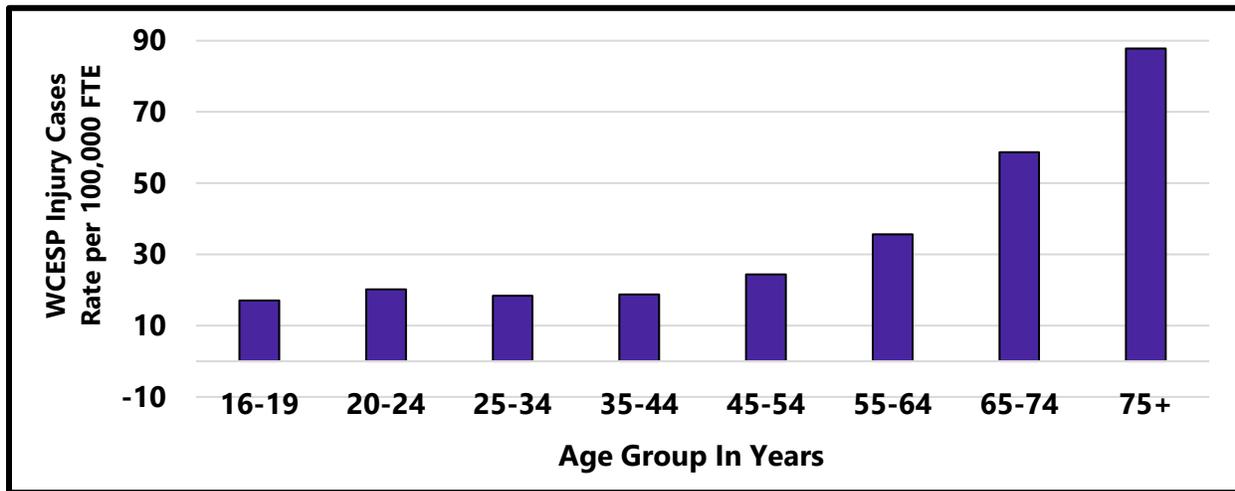


Figure 3: Rates by age group present a different picture of injuries than the numbers of injuries by age group provide (see Tables 1 and 2 above). Studies have shown that while age is less of a predictor of non-fatal injury incidence, older workers are more likely to experience serious injuries requiring hospitalization and fatal injuries. As with gender, advancing age is not the cause of injury, but an indicator of variable underlying risk factors more commonly experienced by older workers.

**Figure 4: Inpatient Hospital Discharge WCESP Injury Cases Crude Rate per 100,000 FTE by Gender and Age, 5-Year Average, 2009-2013**

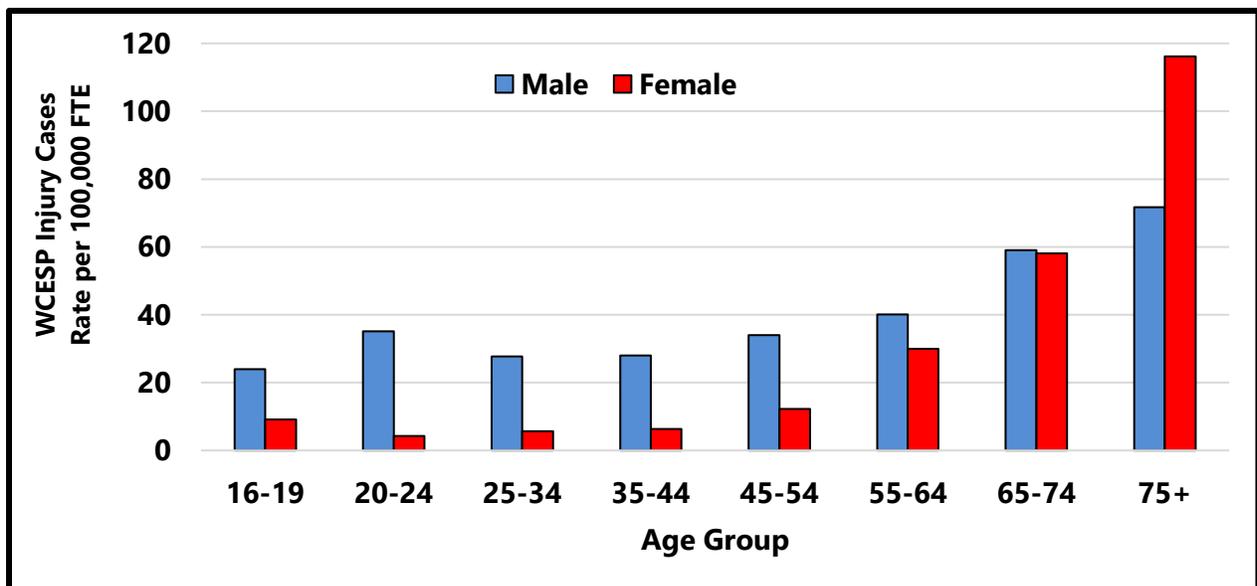


Figure 4: Males represent 52% of the Iowa workforce compared to 48% female workers, but accounted for 75% of the workers' compensation injury cases requiring inpatient hospitalization. Male gender itself is not a risk factor but an indicator of an undetermined difference in hazardous exposures between males and females. Males traditionally outnumber females employed in hazardous occupations and industries. After age 44, the rate of male hospitalized injuries increased steadily but at a slower pace than the dramatic increase in the rate of female injuries, which doubled with each decade of age. Advancing age is not directly the cause of injury, but an indicator of various underlying risk factors more commonly experienced by older workers.

**Figure 5: Five-Year Average Inpatient Hospital Discharge WCESP Injury Cases Crude Rate per 100,000 FTE by Race, 2009-2013**

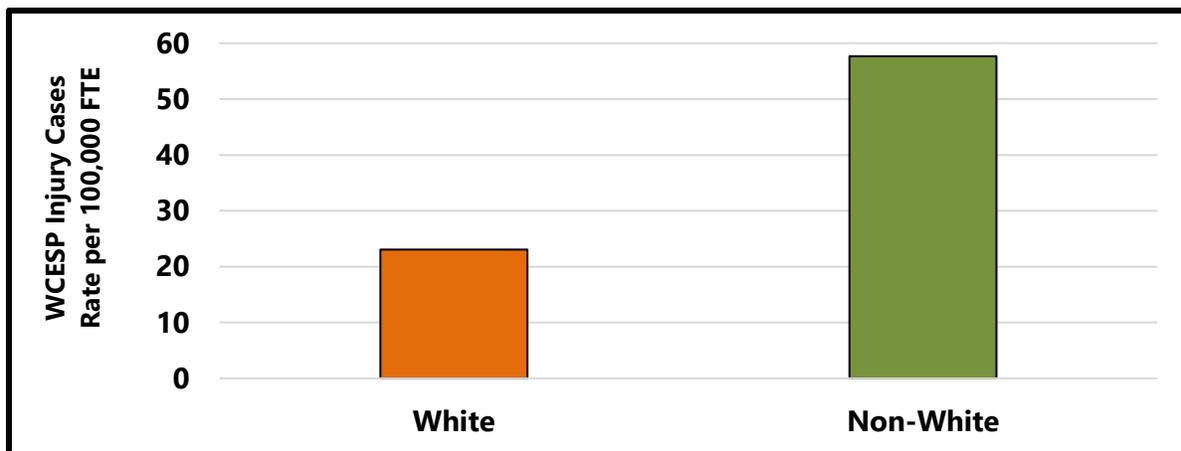


Figure 5: Racial differences in workers do not cause injuries. However, as with other worker demographics, injury analysis by race can identify areas where additional surveillance or research is needed to understand what hazards are behind the disparities seen in injury statistics by race. While workers' compensation claims reflect that white workers averaged 328 injuries yearly requiring hospitalization compared to 48 non-white workers, the rate of injury claims by race is inverted. Because there are fewer non-white workers in Iowa (5.8% average FTE compared to 94.8% average FTE white workers for 2009-2013), smaller injury numbers calculate to a higher rate. This finding could reflect that non-white workers are often employed in hazardous occupations and industries, such as construction, or that they work at sites with less robust safety practices, but causation determination is beyond the scope of this report.

**Figure 6: Inpatient Hospital Discharge WCESP Injury Cases, Crude Rate per 100,000 FTE, by Gender and Race, 5-Year Average, 2009-2013**

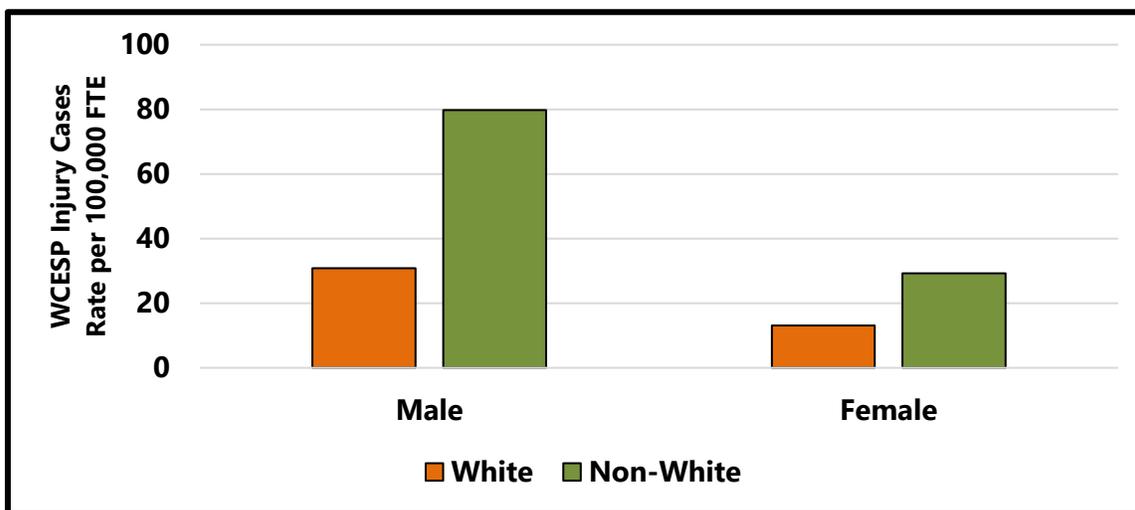


Figure 6: Male hospitalized injury rates are more than twice as high as female rates in Iowa for both white workers and non-white workers, with the greatest rate disparity seen in non-white males. Refer to the above discussion regarding the role worker demographics plays in understanding risk of injury association and causation for both gender and racial descriptors.

**Admitting Diagnosis and External Cause of Injury**

**Table 6: Inpatient Hospital Discharge WCESP Injury Cases by Admitting Diagnosis and Gender, 2009-2013**

Admitting Diagnosis	5-Year Total Numbers			By Admitting Diagnosis	
	Injury Cases	Male Total	Female Total	Annual Average Number	Percentage of all Injuries
Dislocations, Contusions, Amputations, Crushing Injuries	134	120	14	27	7.1%
Sprains & Strains	59	44	15	12	3.1%
Open Wounds	109	93	16	22	5.8%
Burns	125	14	111	25	6.7%
Other or Unspecified	135	107	23	27	7.2%
Internal	170	140	30	34	9.0%
Fractures	1149	800	349	230	61.1%
<b>Total</b>	<b>1881</b>	<b>1318</b>	<b>558</b>	<b>376</b>	<b>100%</b>

Table 6: Small numbers (less than 5 cases per year) required the grouping of some admitting diagnosis categories. Blood vessel and nerve injuries were combined with the other/unspecified injury group. This data represents injuries severe enough to require hospitalization. Injuries treated in other settings (emergency department treatment not requiring admission, medical provider offices or clinics, and treatment onsite at the workplace) are not represented by these numbers or percentages, and may show a different mix or number of injury types by diagnosis.

**Figure 7: Admitting Diagnosis of Inpatient Hospital Discharge WCESP Injury Cases by Percentage, 2009-2013**

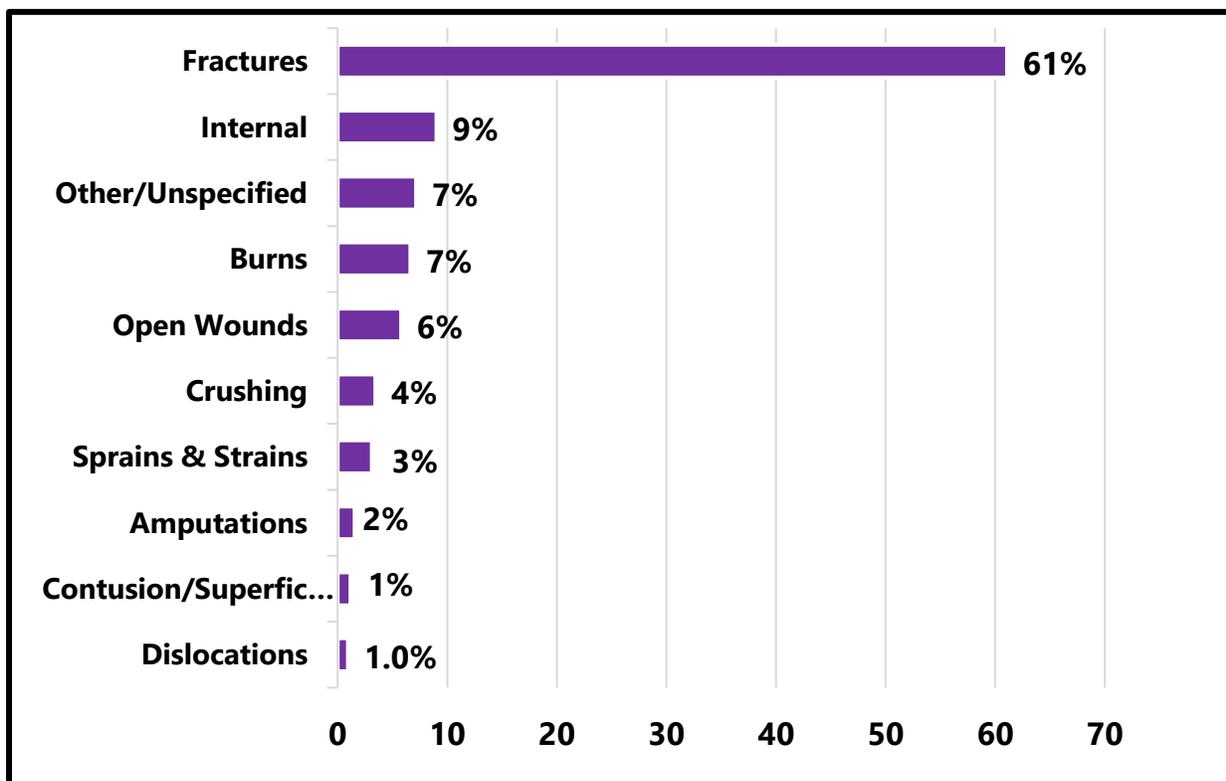


Figure 7: Fractures represent by far the leading admitting diagnosis of hospitalized inpatient workers, with more than 6 out of 10 injuries requiring hospitalization involving fractures. Many of these fractures are the result of slips, trips, or falls on the job, although fractures can also result from other injury causations. Falls are also a leading cause of work-related fatalities in Iowa.

**Table 7: Number of Injuries by External Cause of Injury Coding for Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013**

External Cause of Injury	5-Year Total Number	Percent (%)
Falls (slips, trips, falls)	763	45.1
Other not stated here	588	34.7
Transportation Incidents	288	17.0
Fire, Flame, Explosions	21	1.2
Exposure to harmful substances, natural forces, or environments	19	1.1
Homicide, violence	14	0.8
<b>Total All Injuries by Causation</b>	<b>1693</b>	<b>100</b>
No External Cause of Injury Listed (Numbers not included in percentage calculation)	188	9.9%

**Figure 8: Inpatient Hospital Discharge WCESP Injury Cases by External Cause of Injury, 2009-2013**

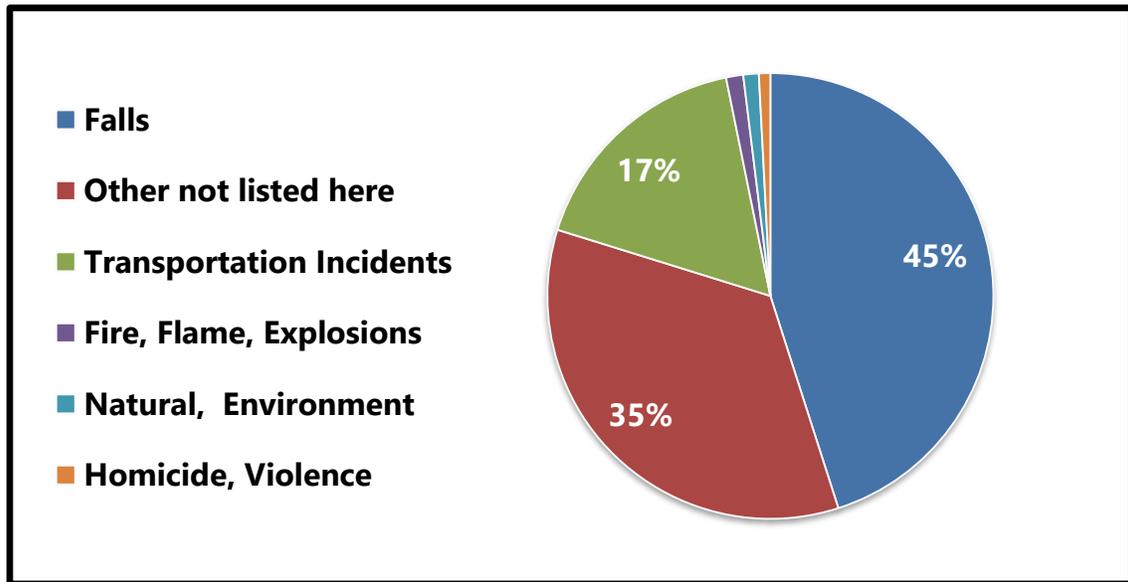


Table 7 and Figure 8: Transportation incidents include: motorized vehicle crashes on and off roadways, other powered vehicle incidents, railway incidents, and vehicle not elsewhere classifiable. Workers' compensation does not cover transportation incidents that occur during normal commuting to and from the home. The 'other not stated here' category includes: activity, external cause status, late effects of unintentional injury, self-inflicted injuries, suffocation, surgical/medical, therapeutic use, other, and undetermined.

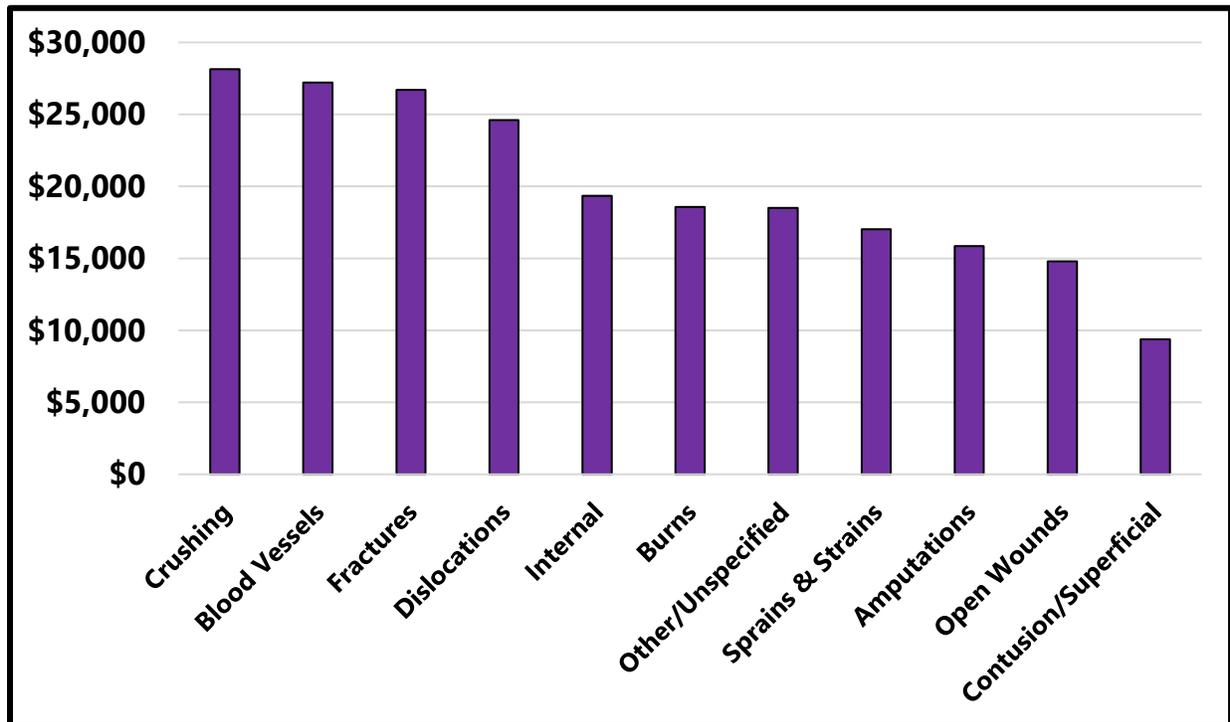
The total number of injury cases analyzed by external cause of injury coding is 188 cases less than the 1,881 injury cases shown earlier in this report. This is due to incomplete coding of the hospital inpatient discharge data records for unknown reasons. When records are coded fully, the coding reflects the external cause of the injury, the location type where the injury occurred (farm, office, highway, factory, etc.), and the intention behind the injury (unintentional, intentional, etc.).

**Table 8: Total Hospital Costs for Inpatient Hospital Discharge WCESP Injury Cases by Admitting Diagnosis, 2009-2013**

<b>Admitting Diagnosis</b>	<b>5-Year Total Injuries</b>	<b>Median Cost</b>	<b>5-Year Total Hospital Costs</b>
Crushing	65	\$28,142	\$3,170,084
Blood Vessels	5	\$27,206	\$275,628
Fractures	1149	\$26,706	\$49,112,304
Dislocations	18	\$24,598	\$603,325
Internal	170	\$19,350	\$7,226,112
Burns	125	\$18,566	\$8,518,325
Other, Unspecified	130	\$18,496	\$4,227,059
Sprains & Strains	59	\$17,022	\$1,243,922
Amputations	29	\$15,846	\$1,075,382
Open Wounds	109	\$14,793	\$2,190,297
Contusion, Superficial	22	\$9,378	\$273,122
<b>Total</b>	<b>1881</b>	<b>\$24,047</b>	<b>\$77,915,560</b>

Table 8: Total hospital costs had a non-parametric distribution, therefore median cost was chosen over the mean cost. This measure is highly dependent on variables such as length of stay and the number of medical procedures performed; therefore the most important point of this table is the 5-year total hospitalization cost of nearly \$78 million for only 1881 injuries covered by workers' compensation. Data from this table is graphically displayed below.

**Figure 9: Median Total Hospital Costs by Admitting Diagnosis of Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013**



### Traumatic Brain Injury Data

Traumatic brain injuries (TBI) accounted for 7.7% of the hospital inpatient workers' compensation claims in 2009 through 2013. Fifty-three percent of TBI claims resulted from falls, which include slips, trips, and falls from various heights. Falls are the number one cause of brain injury in Iowa, both for workers and non-workers, followed by transportation incidents.

According to a 2016 National Institute of Occupational Safety and Health (NIOSH) report\* looking at US deaths due to TBIs in the construction industry in the United States during 2003 to 2010:

- Workers in small construction companies (<20 employees) were more than 2.5 times more likely than those in larger companies (≥100 employees) to die from a TBI.
- Males were 7 times more likely than females to die from a TBI.
- Older workers (≥65 years) were almost 4 times more likely than younger workers (25–34 years) to have a fatal TBI.

- The TBI fatality rate was significantly higher for foreign-born than for native-born workers.
- Falls, especially from roofs, ladders, and scaffolds, led to >50% of fatal work-related TBIs.
- Structural iron and steel workers and roofers had the highest fatal TBI rate, and TBIs related to falls caused most of their deaths.

\*Reference: CDC NIOSH online blog at this [CDC NIOSH 2016 blog regarding TBI and Construction](#) accessed June 2016.

**Table 9: Traumatic Brain Injuries Demographic Analysis of Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013**

Gender	TBI	Non-TBI
Male	124	1,295
Female	20	442
Race	TBI	Non-TBI
White	121	1,521
Non-White	23	216
<b>Total</b>	<b>144</b>	<b>1,737</b>
<b>5-Year Annual Average</b>	<b>29</b>	<b>348</b>

Table 9: Refer to interpretative limitations regarding demographic-based statistics discussed on pages 10 – 14 of this report.

**Figure 10: Traumatic Brain Injury by causation, Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013**

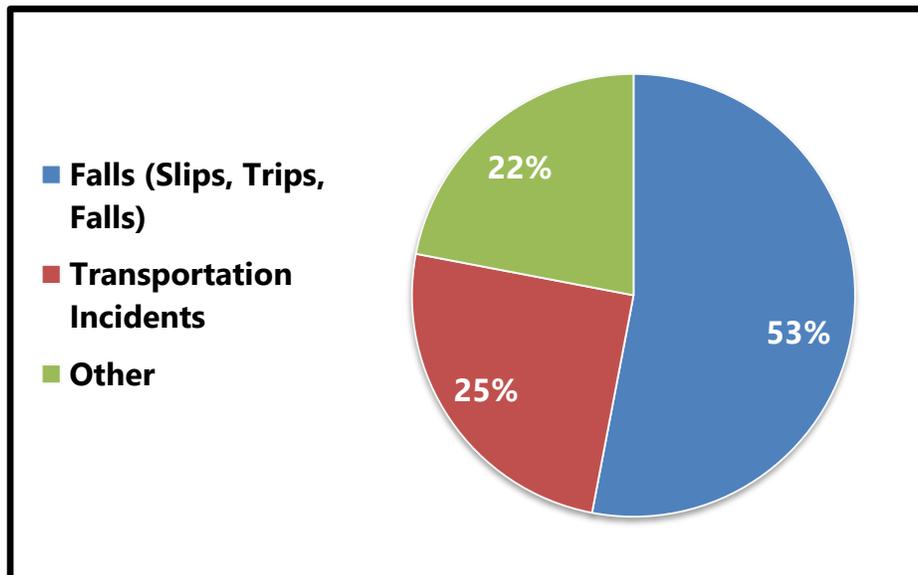


Figure 10: An injury with a causation code related to a transportation incident (which includes motor vehicle crashes, other road vehicle incidents, railway incidents, and vehicles not elsewhere classifiable) were collapsed into the transportation category. Injuries with a causation coded as activity, homicide, natural and environmental, or therapeutic use were collapsed into 'other'. 18 injuries with missing values were not included in data for Figure 10.

**Table 10: Total Hospital Costs for Traumatic Brain Injuries Admitting Diagnoses, 2009-2013**

Admitting Diagnosis	5-Year Total	Percent of Injuries (%)	5-Year Total Cost	Percent of Costs (%)
TBI	144	7.7	\$8,635,998	11.1
Non-TBI	1737	92.3	\$69,279,550	88.9
<b>Total</b>	<b>1881</b>	<b>100</b>	<b>\$77,915,548</b>	<b>100</b>

Table 10: While hospital inpatient TBI injuries account for only 7.7% of the workers' compensation claims in 2009-2013, those injuries accounted for 11.1% of the total hospital costs.

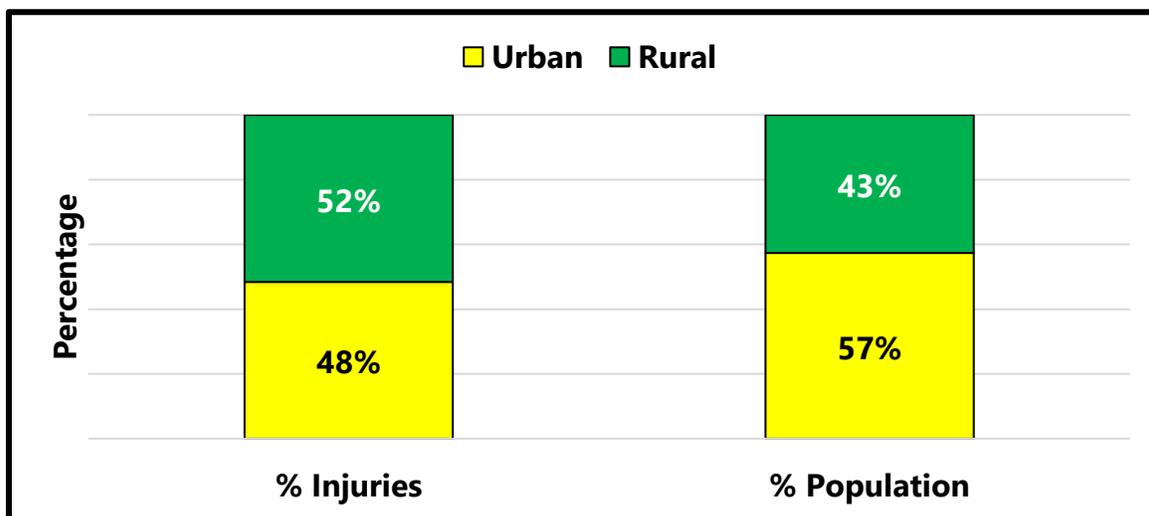
### Urban and Rural Data Analysis

Urban and rural data analysis was done using the United States Department of Agriculture 2013 Urban Influence Codes that were established based on 2010 Census Population data. The patient's county of residence was used for this classification. Codes identifying metropolitan counties were considered urban and those identifying non-metropolitan counties were considered rural.

**Table 11: Inpatient Hospital Discharge WCESP Injury Cases, analyzed by Urban and Rural Areas, 2009-2013**

Location	Number of Injuries	2010 Population	Percent Injuries	Percent Population
Urban	910	1,746,700	48	57
Rural	971	1,299,655	52	43
<b>Total</b>	<b>1881</b>	<b>3,046,355</b>	<b>100</b>	<b>100</b>

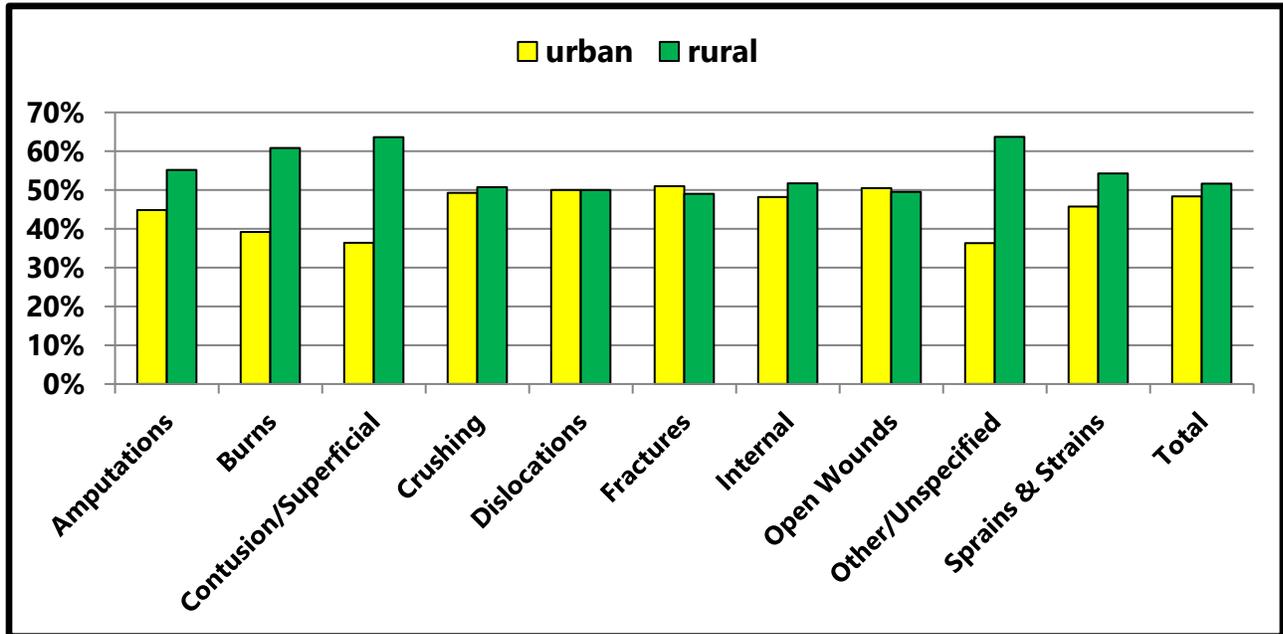
**Figure 11: Inpatient Hospital Discharge WCESP Injury Cases y, Comparison based on Urban or Rural Residence of Population and Injury Percentages, 2009-2013**



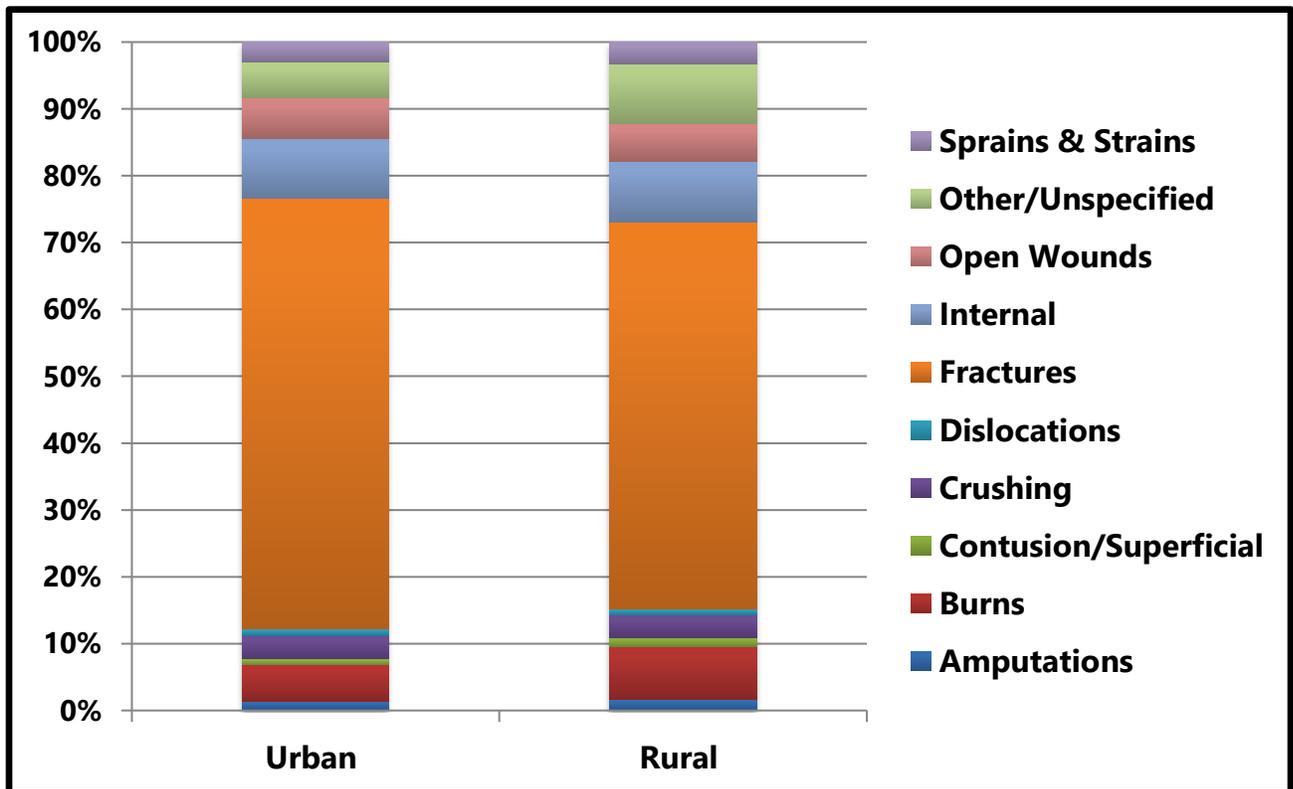
**Table 12: Admitting Diagnosis of Inpatient Hospital Discharge WCESP Injury Cases analyzed by Urban or Rural Home Residence, 2009-2013**

Admitting Diagnosis	Number of Injuries			Percent of Injuries within Area		Percent of Injuries by Diagnosis	
	Urban	Rural	Total	Urban	Rural	Urban	Rural
Amputations	13	16	29	1.4	1.7	45	55
Burns	49	76	125	5.4	7.8	39	61
Contusion, Superficial	8	14	22	0.9	1.4	36	64
Crushing	32	33	65	3.5	3.4	49	51
Dislocations	9	9	18	1.0	0.9	50	50
Fractures	586	563	1149	64.4	58.0	51	49
Internal	82	88	170	9.0	9.1	48	52
Open Wounds	55	54	109	6.0	5.6	50	50
Other, Unspecified	49	86	135	5.4	8.9	36	64
Sprains & Strains	27	32	59	3.0	3.3	46	54
<b>Total</b>	<b>910</b>	<b>971</b>	<b>1881</b>	<b>100%</b>	<b>100%</b>	<b>48%</b>	<b>52%</b>

**Figure 12: Percentage of Inpatient Hospital Discharge WCESP Injury Cases analyzed by Urban or Rural Residence, 2009-2013**



**Figure 13: Rural and Urban Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013**



**Table 13: Analysis of External Cause of Injury for Inpatient Hospital Discharge WCESP Injury Cases by Urban vs. Rural Residence, 2009-2013**

Cause of Injury	Number by			Percent by Cause within Area		Percent of Injuries by External Cause	
	Urban	Rural	Total	Urban	Rural	Urban	Rural
Falls	390	373	763	42.9%	38.4%	51.1%	48.9%
Other Not Listed	279	309	588	31.9%	32.1%	48.2%	51.8%
Transportation Incidences	158	130	288	17.4%	13.4%	54.9%	45.1%
Missing causation data	58	130	188	6.4%	13.4%	30.9%	69.1%
Natural, Environmental	8	11	19	0.9%	1.1%	42.1%	57.9%
Fire, Flames, Explosion	6	15	21	0.7%	1.5%	28.6%	71.4%
<b>Total</b>	<b>910</b>	<b>971</b>	<b>1881</b>	<b>100%</b>	<b>100%</b>	<b>48%</b>	<b>52%</b>

Table 13: Causation data with counts less than 5 were combined into the other not listed category. This includes homicides and violence data, which will be represented elsewhere by percentage only.

**Figure 14: Urban or Rural Number of Injuries by Area and External Cause of Injury, Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013**

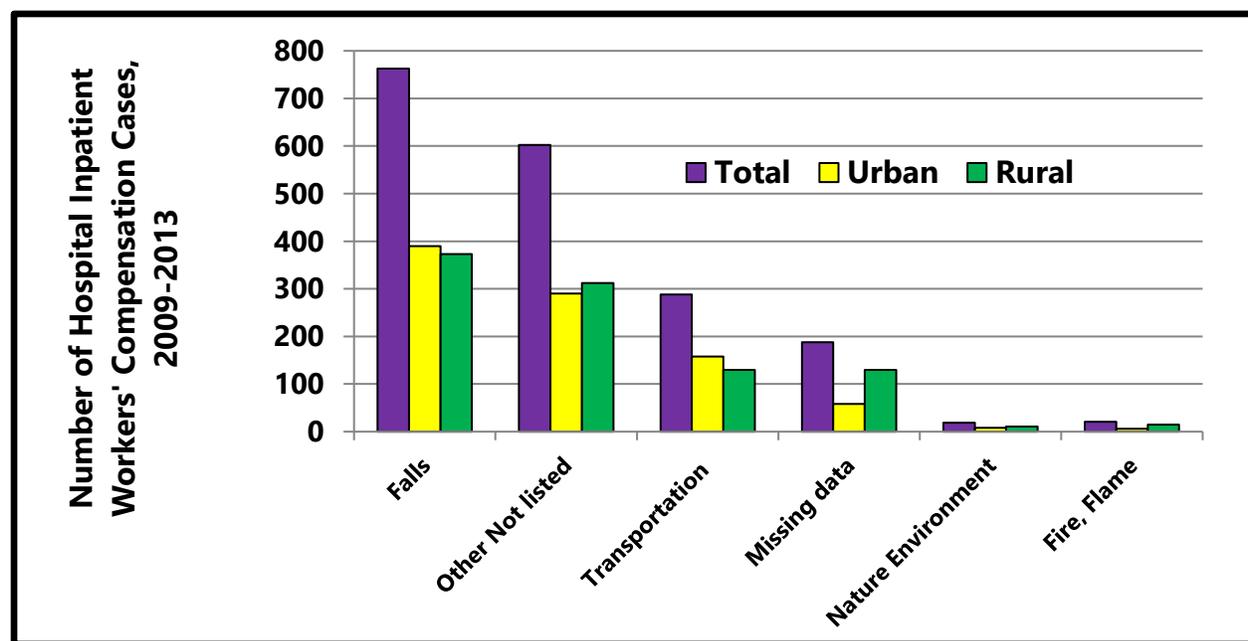


Figure 14: Falls and transportation incidents are the two causation categories with the largest numbers of hospital inpatient injuries for work-related cases covered by workers' compensation. Other injury causes not listed include a variety of injury causations that do not have numbers great enough to be shown individually. This could be an indication of incomplete or inadequate external cause of injury coding (often referred to as 'e-coding') of hospital discharge data.

**Figure 15: Urban or Rural Percentage of Injuries by Area and External Cause of Injury, Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013**

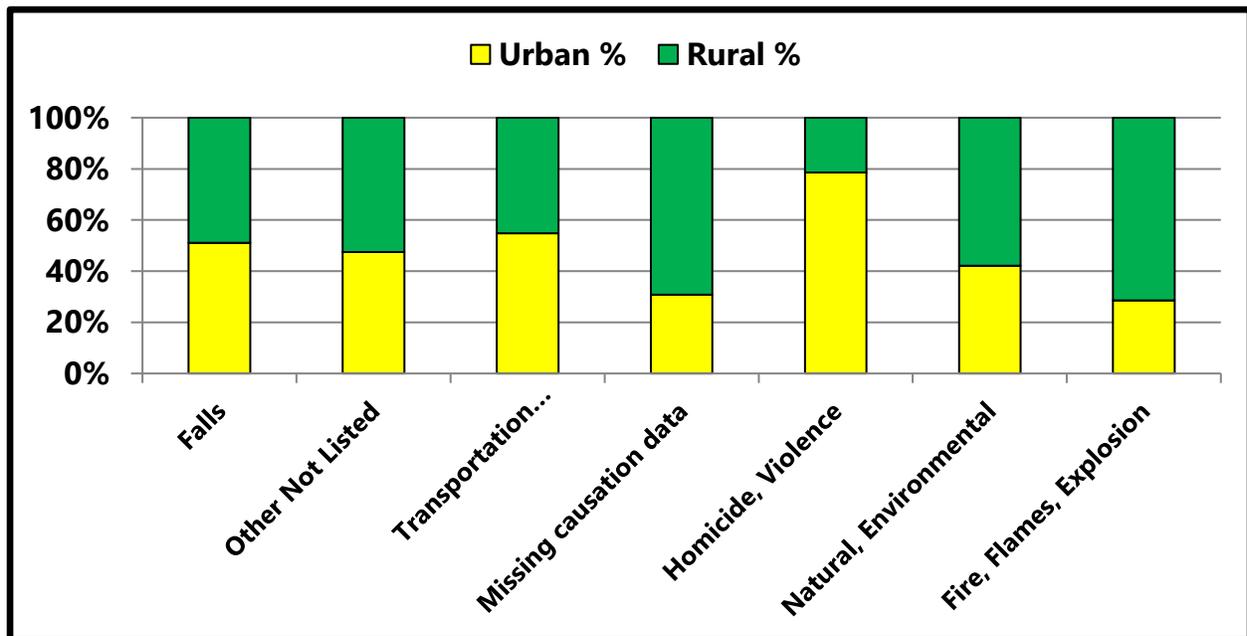


Figure 15: Urban and rural comparison in the chart above is made for each type of injury causation to gain a better understanding of which group of workers are the most likely to suffer from that type of injury. Homicide and violent injuries are not a major cause of worker injury in Iowa (less than 1% of worker injuries requiring hospitalization - see Table 4, Figure 7) but worker injuries caused by violence or resulting in homicide are much more prevalent in urban than rural areas. Transportation and fall injuries comprised almost 56% of all hospitalized workers' compensation claims from 2009-2013 and show a more equal distribution between urban and rural workers. Almost 10% of the data (188 cases) were missing external cause of injury coding and it appears to be a bigger issue in rural areas than urban areas.

**Figure 16: Rural and Urban Injury Admitting Diagnosis External Cause Percentage of Total Injuries, Inpatient Hospital Discharge WCESP Injury Cases, 2009-2013**

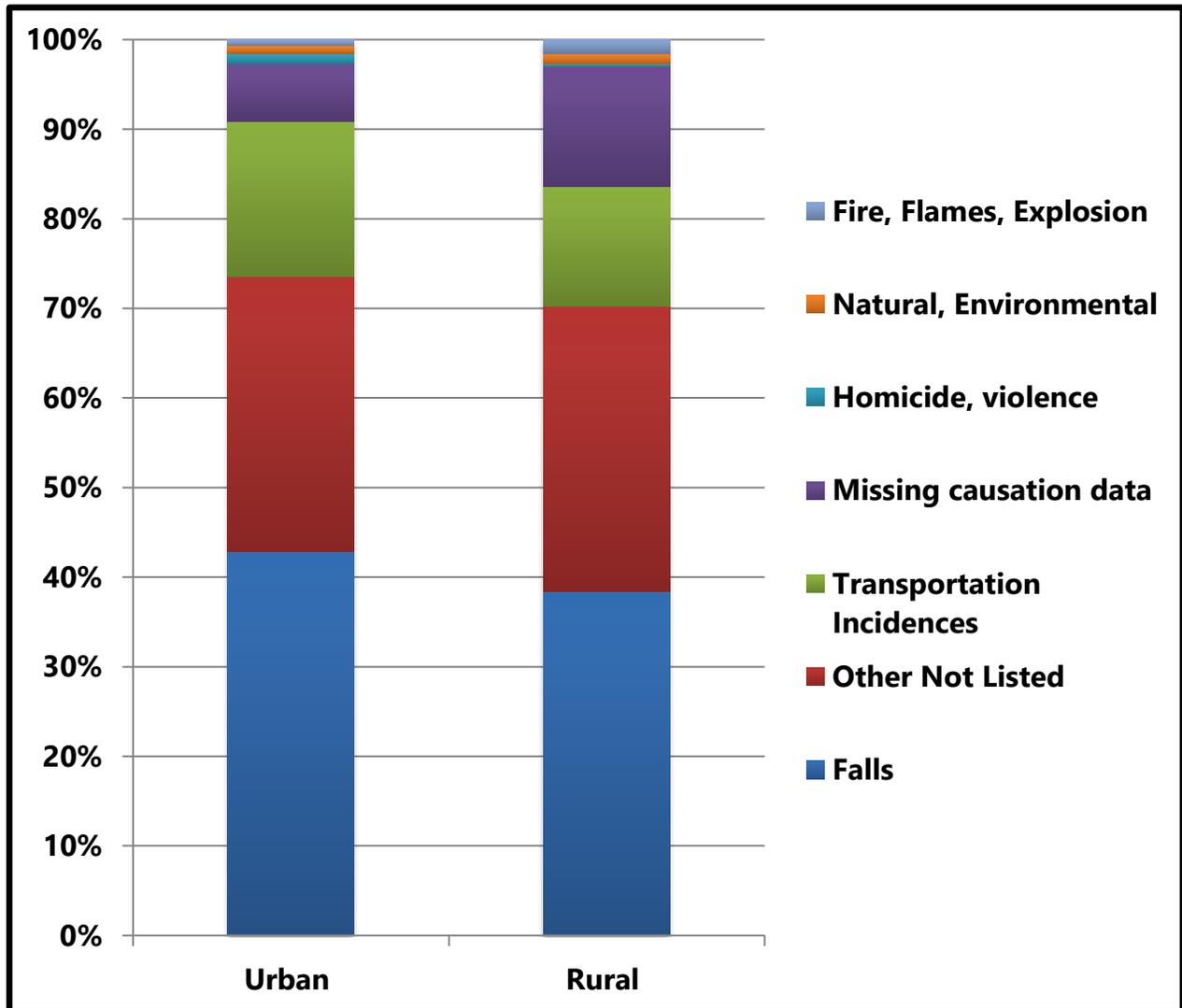
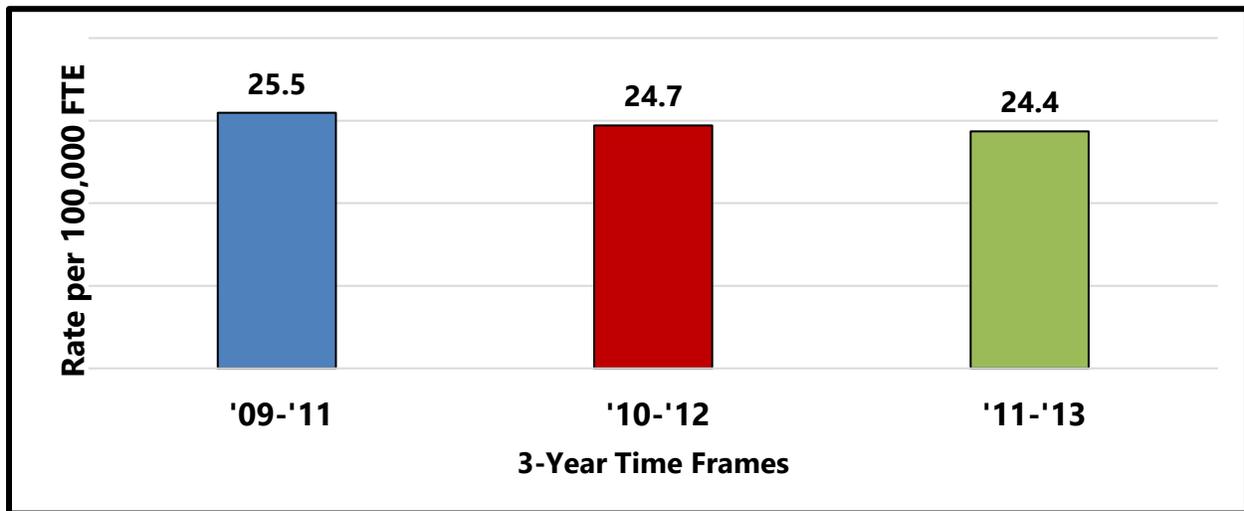


Figure 16: Two broad causes of injuries - falls and transportation incidences - accounted for over 50% of Iowa workers' compensation claims for hospital inpatient care in 2009-2013 (60% in urban areas, 52% in rural areas). The large amount of cases that had to be grouped as 'other not listed' could reflect an issue of inadequate injury causation coding or a lack of complete reporting in the hospital discharge record.

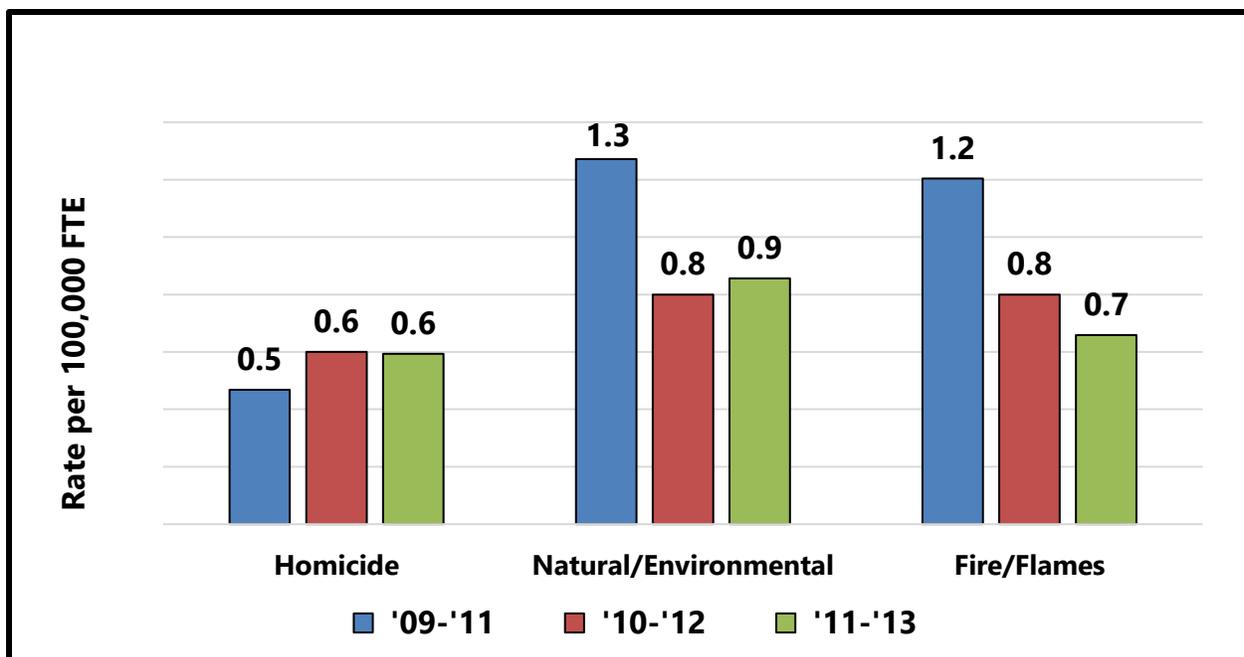
### Three-Year Rolling Average Trend Analysis, 2009-2013

Because of yearly fluctuations in injury data, it is often helpful to use a rolling average (also called a moving average) of the data counts or rates over time to smooth out the data highs and lows. A rolling average can help visual trends that would otherwise be hard to detect.

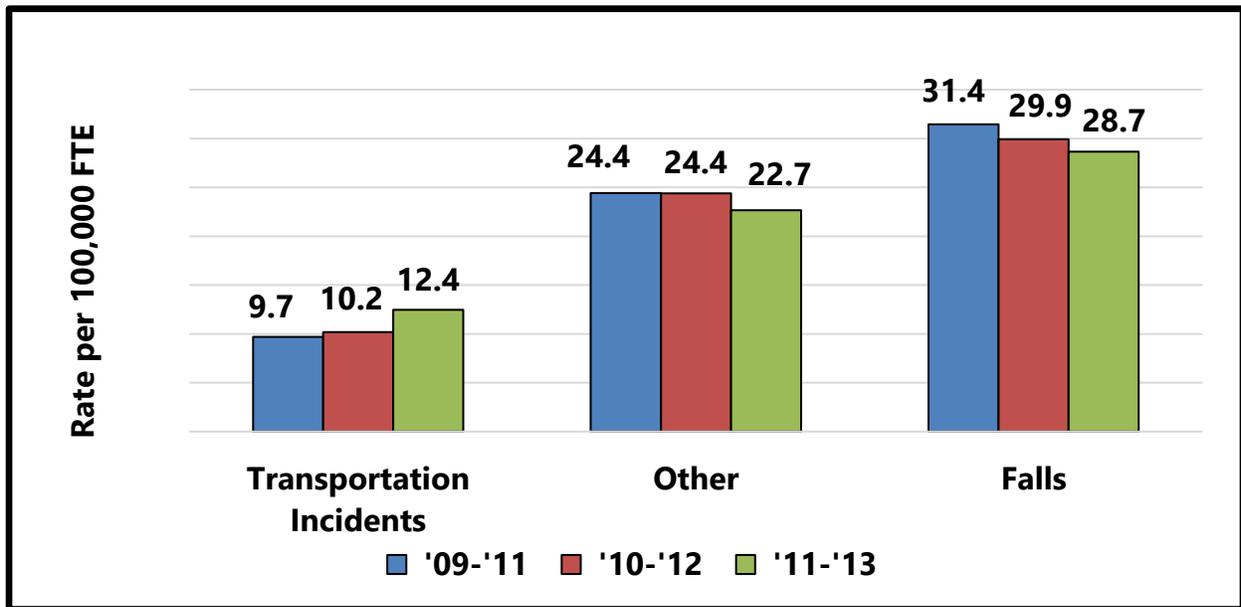
**Figure 17: Three-Year Rolling Average Trend: Inpatient Hospital Discharge WCESP Injury Cases Rate per 100,000 FTE, 2009-2013**



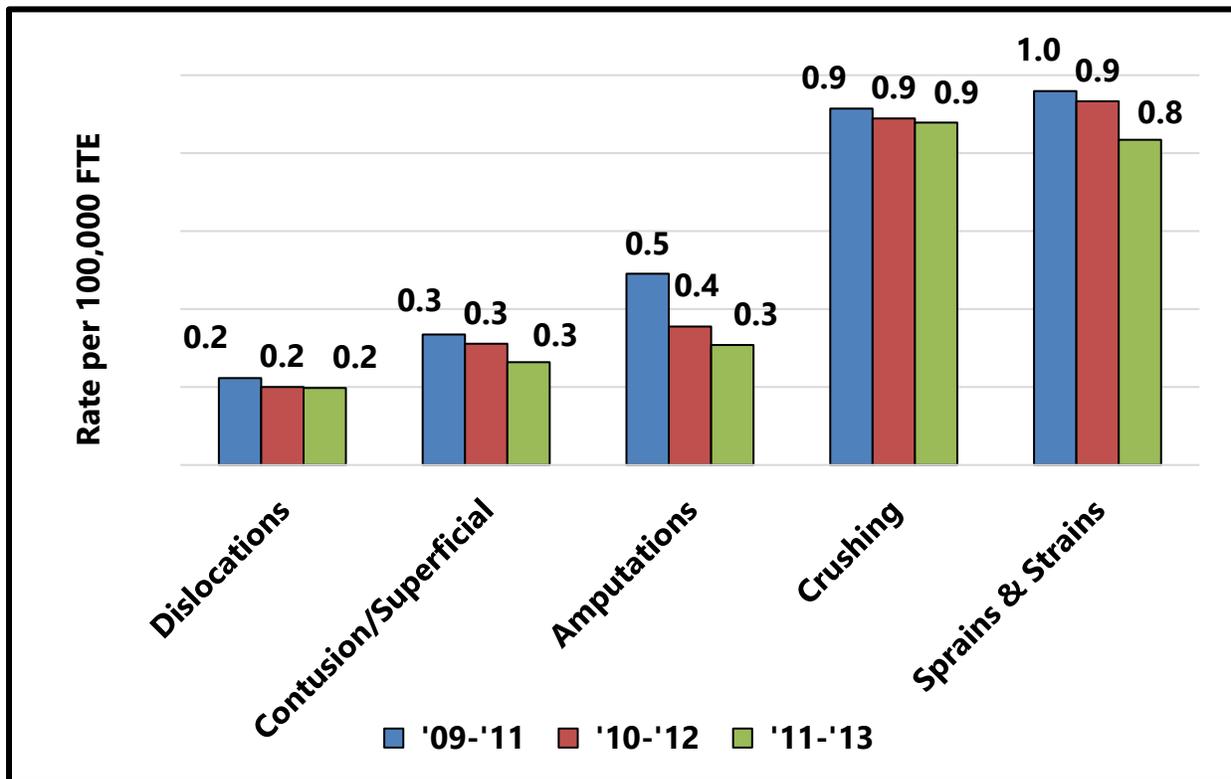
**Figure 17.a: Three-Year Rolling Average Trend: Inpatient Hospital Discharge WCESP Injury Cases Rate per 100,000 FTE by External Cause of Injury, 2009-2013**



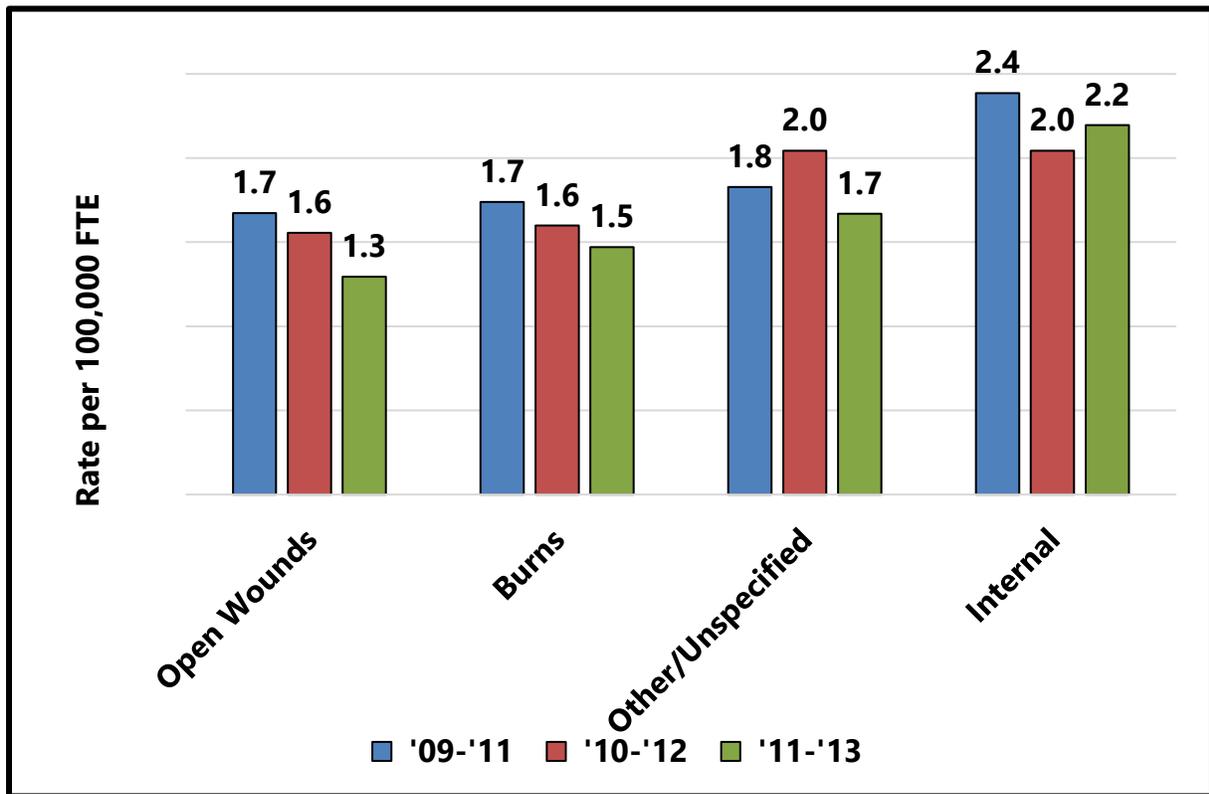
**Figure 17.b: Three-Year Rolling Average Trend: Inpatient Hospital Discharge WCESP Injury Cases Rate per 100,000 FTE by External Cause of Injury, 2009-2013**



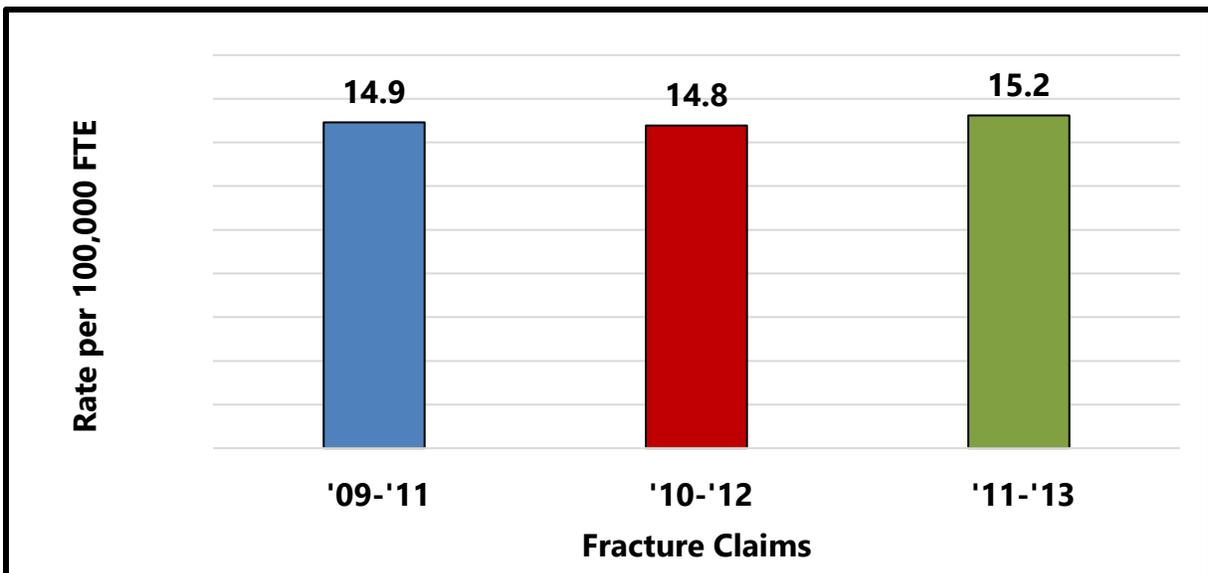
**Figure 18.a: Three-Year Rolling Average Trend: Inpatient Hospital Discharge WCESP Injury Cases Rate per 100,000 FTE by Admitting Diagnosis, 2009-2013**



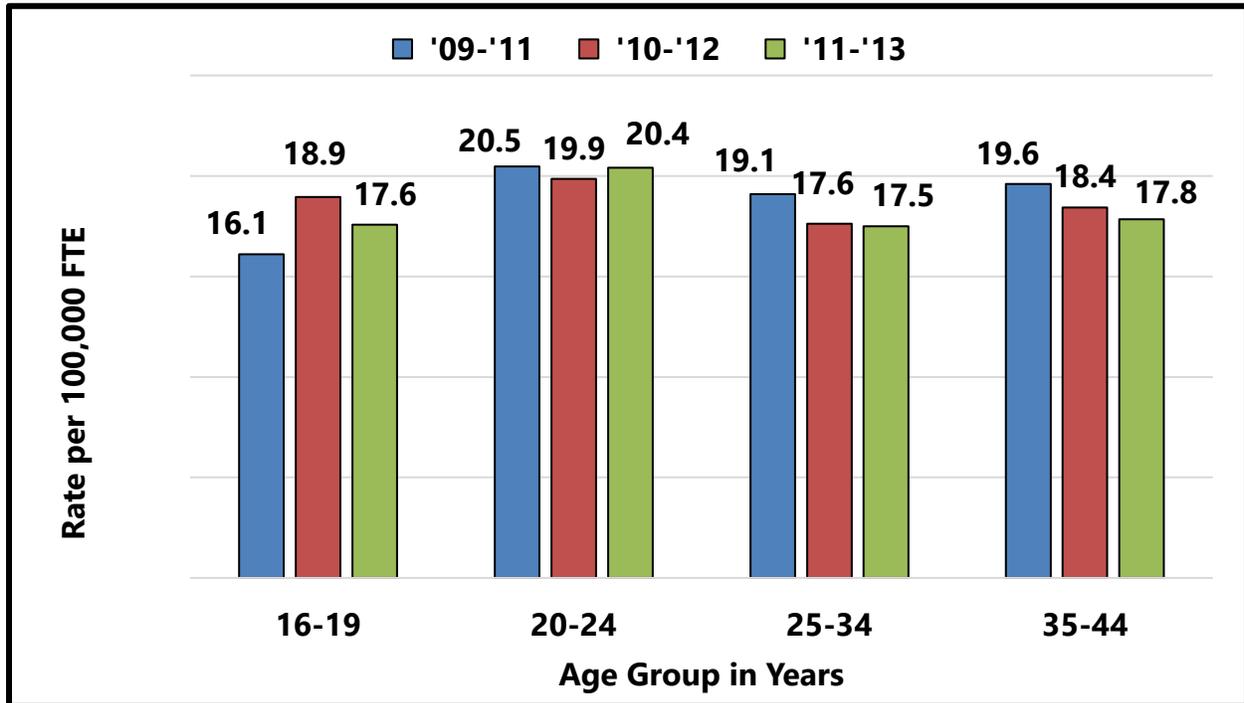
**Figure 18.b: Three-Year Rolling Average Trend: Inpatient Hospital Discharge WCESP Injury Cases Rate per 100,000 FTE by Admitting Diagnosis, 2009-2013**



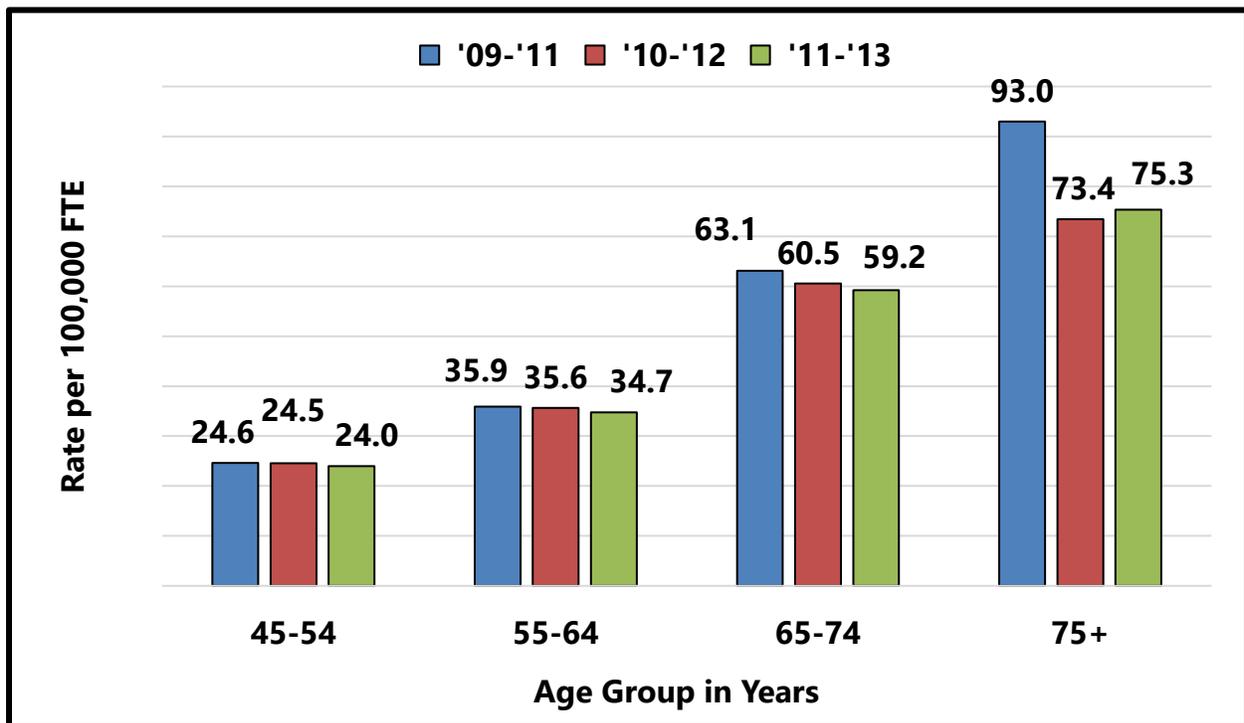
**Figure 18.c: Three-Year Rolling Average Trend of Inpatient Hospital Discharge WCESP Injury Cases Rate per 100,000 FTE for Injury by Admitting Diagnosis of Fracture, 2009-2013**



**Figure 19.a: Three-Year Rolling Average Trend of Inpatient Hospital Discharge WCESP Injury Cases by Age, 2009-2013**



**Figure 19.b: Three-Year Rolling Average Trend of Inpatient Hospital Discharge WCESP Injury Cases by Age, 2009-2013**



## **Work-Related Farm Injuries – Iowa Trauma Registry Data**

Data used for this part of the Iowa Occupational Health and Safety injury report was extracted from the Iowa Trauma Registry (ITR) data set used for the full Burden of Injury report.

### **Iowa Trauma Registry reportable data criteria**

It is important to know the criteria for data inclusion in the ITR dataset to understand both the benefits and limitations for its use in injury surveillance. The ITR dataset includes:

- Reports made by Iowa Trauma Centers through an electronic database to IDPH
- Incidents that are TRAUMATIC in nature

Definition of a Trauma patient - a victim of an external cause of injury that results in major or minor tissue damage or destruction caused by intentional or unintentional exposure to thermal, mechanical, electrical or chemical energy, or by the absence of heat or oxygen (ICD-9 International Classification of Diseases, 9th revision Codes 800.00 - 999.00). Reference: IDPH Trauma Registry Dictionary, 2014.

### **To be included in the ITR:**

1. The Patient must present with at least one

- injury ICD-9 diagnosis code between 800.00 and 959.9, including 940-949 (burns) or
- Injury diagnoses as defined by ICD-10-CM code S00-S99, T07, T14, T20-T28, T30-T32, and T79.A1-T79.A9 code range:

#### **And**

- who are admissions, to be defined as any patient beyond the Emergency Department, or
- who died after receiving any evaluation or treatment or were dead on arrival, or
- who were transferred into or out of the trauma care facility

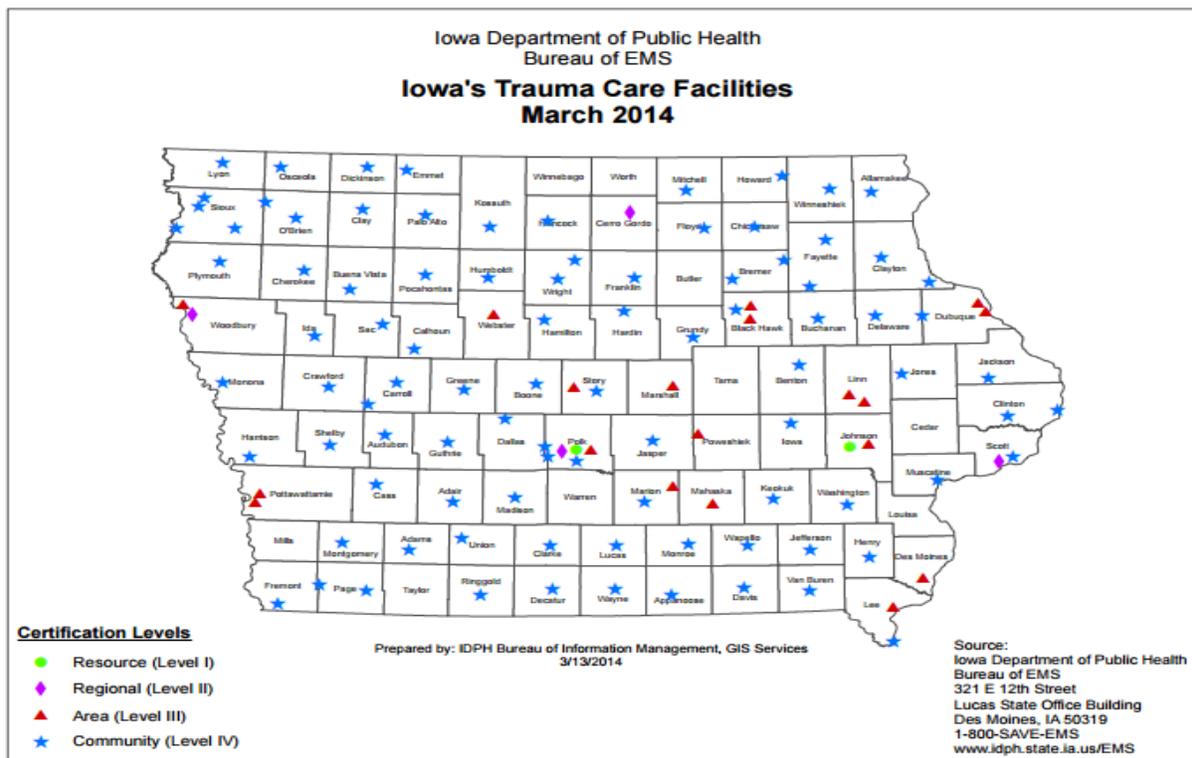
#### **Or**

2. The trauma care facility trauma team is activated.

**Case Definition – Data Query: Work-related farm injuries in the Iowa Trauma Registry 2009-2013**

- Was this a work-related trauma injury? Yes
- Was this farm-related? Yes
- If either of the above data elements were missing, unknown, or not applicable, the incident was not included in this report.

**Figure 20: Location of Iowa’s Trauma Care Facilities as of March 2014**



It should be noted that not all Iowa Trauma Care Facilities reported injuries through the electronic trauma registry in 2009-2013. The number of sites using the ITR was increasing, but did not include all community level facilities. Those not using the ITR reported farm injuries by mail or fax, and that information was not included in the ITR dataset.

For more information about the current Iowa Trauma Registry, refer to the [IDPH Bureau of Emergency and Trauma Services Data Registry web page](#).

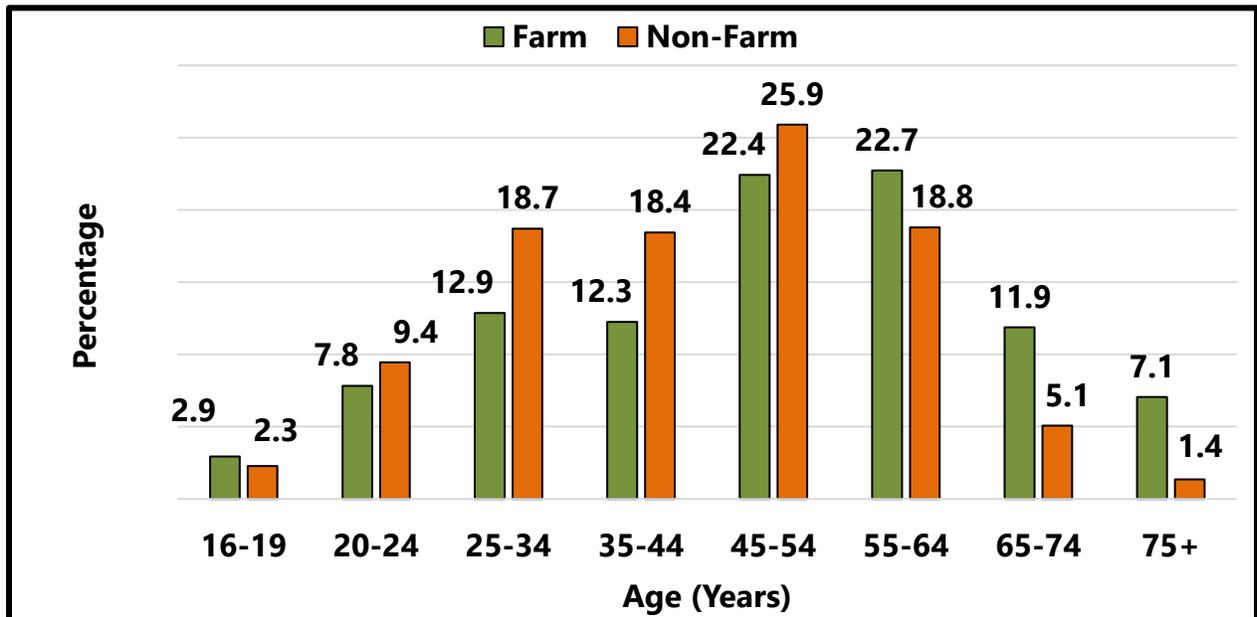
**Table 14: Total Work-related Farm vs. Non-Farm Injuries by Age, Gender, and Race, 2009-2013, Iowa Trauma Registry**

Age (years)	All Injuries	All Injuries By Age Range		Farm Injuries By Age Range		Non-Farm Injuries By Age Range	
	Inj. Num.	Farm Pct. of All	Non-Farm Pct. of All	Farm Num.	Pct. of Farm	Non-farm Num.	Pct. of Non-Farm
<b>16-19</b>	124	0.8%	1.7%	38	2.9%	86	2.3%
<b>20-24</b>	457	2.0%	7.0%	101	7.8%	356	9.4%
<b>25-34</b>	871	3.3%	13.9%	166	12.9%	705	18.7%
<b>35-44</b>	853	3.1%	13.7%	158	12.3%	695	18.4%
<b>45-54</b>	1265	5.7%	19.3%	289	22.4%	976	25.9%
<b>55-64</b>	1001	5.8%	14.0%	293	22.7%	708	18.8%
<b>65-74</b>	344	3.0%	3.8%	153	11.9%	191	5.1%
<b>75+</b>	142	1.8%	1.0%	91	7.1%	51	1.4%
<b>Total</b>	<b>5057</b>	<b>25.5%</b>	<b>74.5%</b>	<b>1289</b>	<b>100%</b>	<b>3768</b>	<b>100%</b>
Gender	All Injuries	All Injuries by Gender		Farm Injuries by Gender		Non-Farm Injuries by Gender	
	Inj. Num.	Farm Pct. of All	Non-Farm Pct. of All	Farm Num.	Pct. of Farm	Non-farm Num.	Pct. of Non-Farm
<b>Male</b>	4383	23.9%	62.5%	1212	92.9%	3171	84.1%
<b>Female</b>	691	13.6%	11.8%	93	7.1%	598	15.9%
<b>Total</b>	<b>5074</b>	<b>25.7%</b>	<b>74.3%</b>	<b>1305</b>	<b>100%</b>	<b>3769</b>	<b>100%</b>
Race	All Injuries	All Injuries by Race		Farm Injuries by Race		Non-Farm Injuries by Race	
	Inj. Num.	Farm Pct. of All	Non-Farm Pct. of All	Farm Num.	Pct. of Farm	Non-farm Num.	Pct. of Non-Farm
<b>White</b>	4206	28.6%	71.4%	1204	95.8%	3002	89.4%
<b>Non-White</b>	409	13.0%	87.0%	53	4.2%	356	10.6%
<b>Total</b>	<b>4615</b>	<b>27.2%</b>	<b>72.8%</b>	<b>1257</b>	<b>100</b>	<b>3358</b>	<b>100</b>

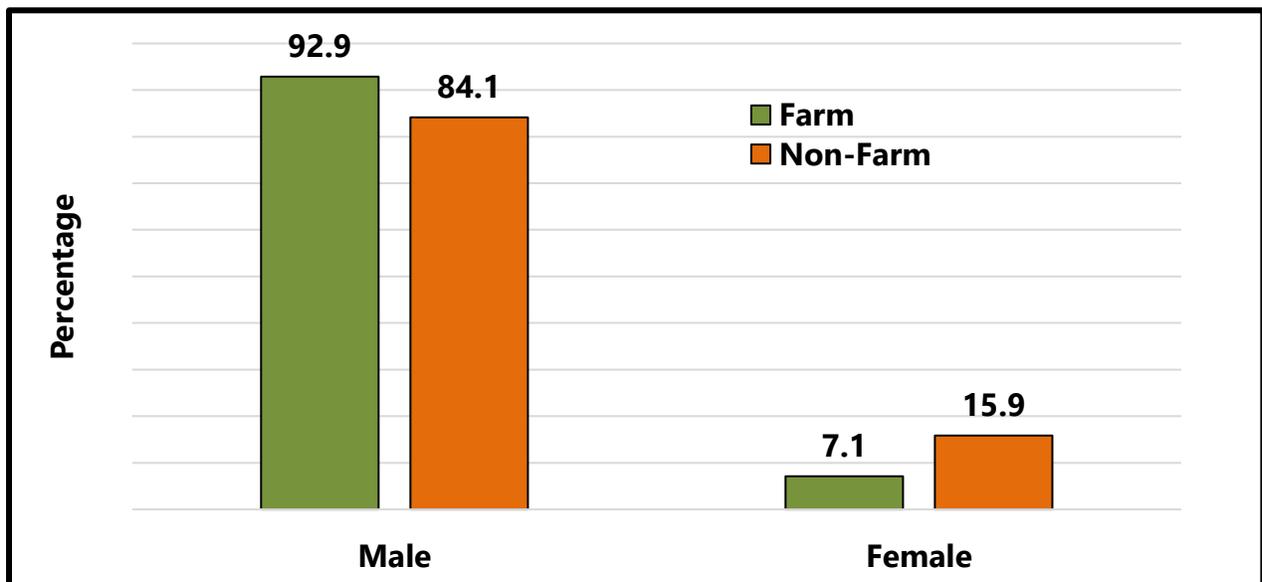
Table 14: Total numbers of injuries analyzed by age, gender, and race differ because all values identified as missing, not applicable, or unknown were excluded. Refer to the

methods section for more details regarding data selection from the ITR. Data is shown graphically below.

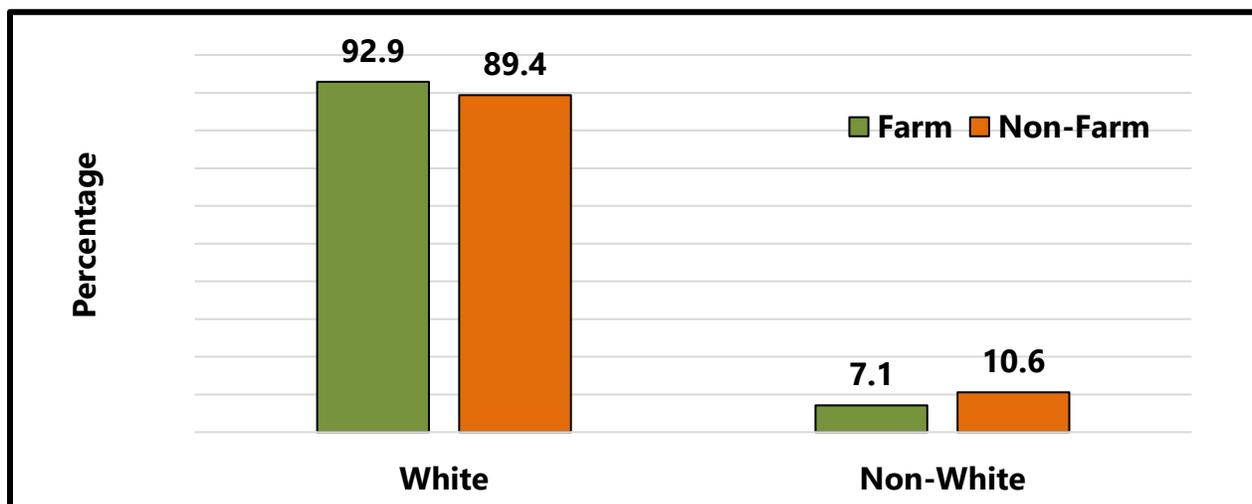
**Figure 21: Work-related Injuries reported through the Iowa Trauma Registry: Percent of All Farm and All Non-Farm Injuries by Age Range, 2009-2013**



**Figure 22: Work-related Injuries reported through the Iowa Trauma Registry: Percentage of All Farm and All Non-Farm Injuries by Gender, 2009-2013**



**Figure 23: Work-related Injuries reported through the Iowa Trauma Registry: Percentage of All Farm and All Non-Farm Injuries by Race, 2009-2013**

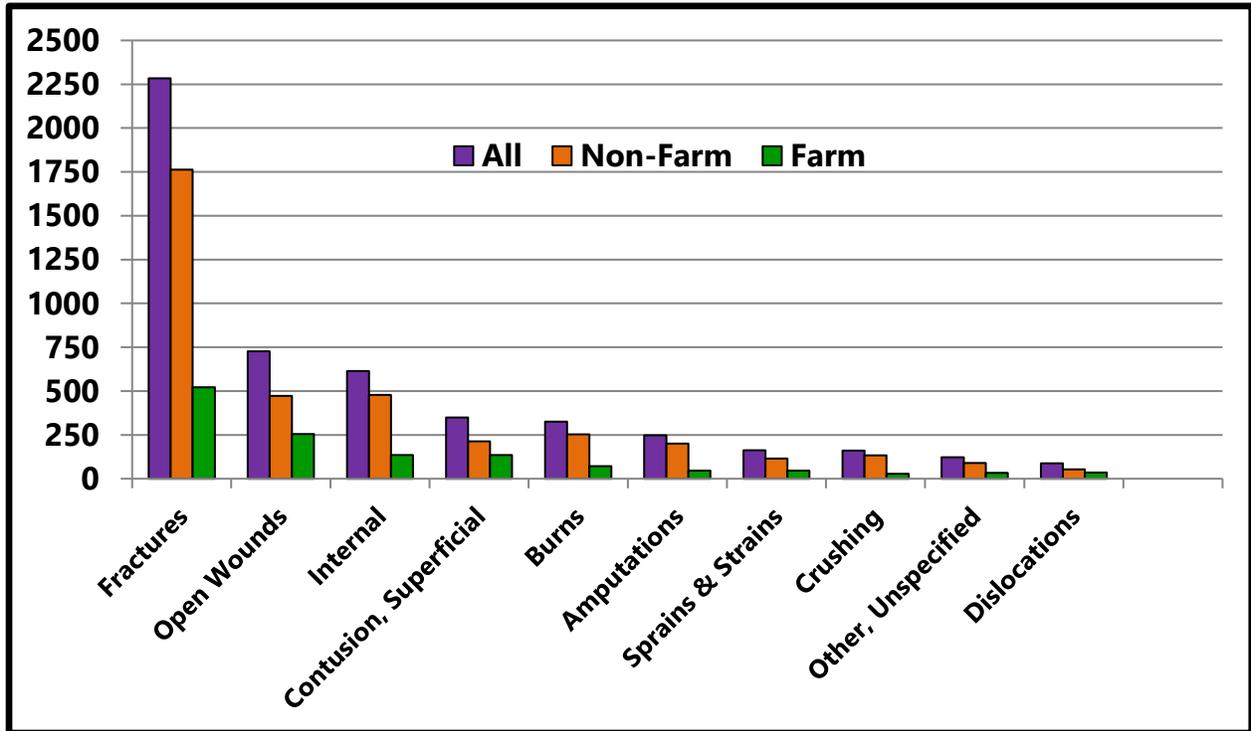


**Table 15: Work-related Injuries reported through the Iowa Trauma Registry: Total Farm and Non-Farm Injuries by Primary Diagnosis, 2009-2013**

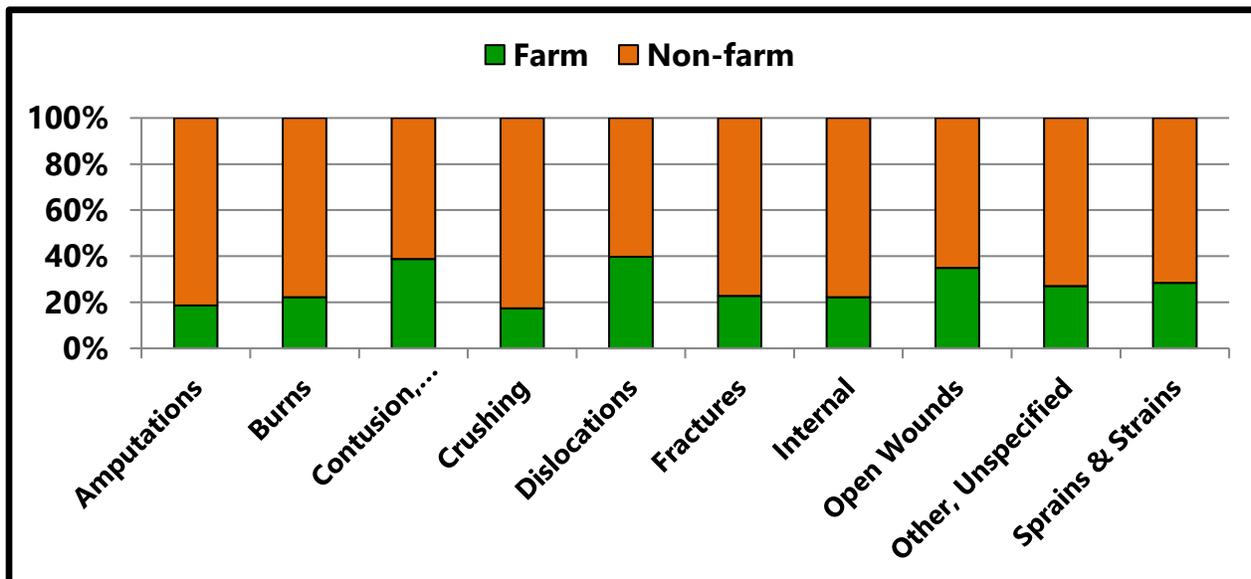
Primary Diagnosis	ITR All Work Injures		ITR Farm Injuries		ITR Non-Farm Injuries		Percent of All Injuries	
	Number Diag.	Percent Diag.	Number Diag.	Percent Diag.	Number Diag.	Percent Diag.	Farm	Non-Farm
Amputations	247	5.0%	46	3.6%	201	5.5%	0.9%	4.1%
Burns	325	6.6%	72	5.7%	253	6.9%	1.5%	5.1%
Contusion, Superficial	350	7.1%	136	10.7%	214	5.8%	2.7%	4.3%
Crushing	161	3.2%	28	2.2%	133	3.6%	0.6%	2.7%
Dislocations	88	1.8%	35	2.7%	53	1.4%	0.7%	1.1%
Fractures	2284	46.1%	521	40.9%	1763	47.9%	10.5%	35.6%
Internal	614	12.4%	136	10.7%	478	13.0%	2.7%	9.6%
Open Wounds	726	14.6%	254	19.9%	472	12.8%	5.1%	9.5%
Sprains & Strains	162	3.3%	46	3.6%	116	3.1%	0.9%	2.3%
Other, Unspecified	122	2.5%	33	2.6%	89	2.4%	0.7%	1.8%
<b>Total</b>	<b>4957</b>	<b>100%</b>	<b>1274</b>	<b>100%</b>	<b>3683</b>	<b>100%</b>	<b>25.7%</b>	<b>74.3%</b>

Table 15: Diagnosis categories with small numbers were collapsed into other or unspecified group, including the blood vessels and nerves injuries for the 5-year total.

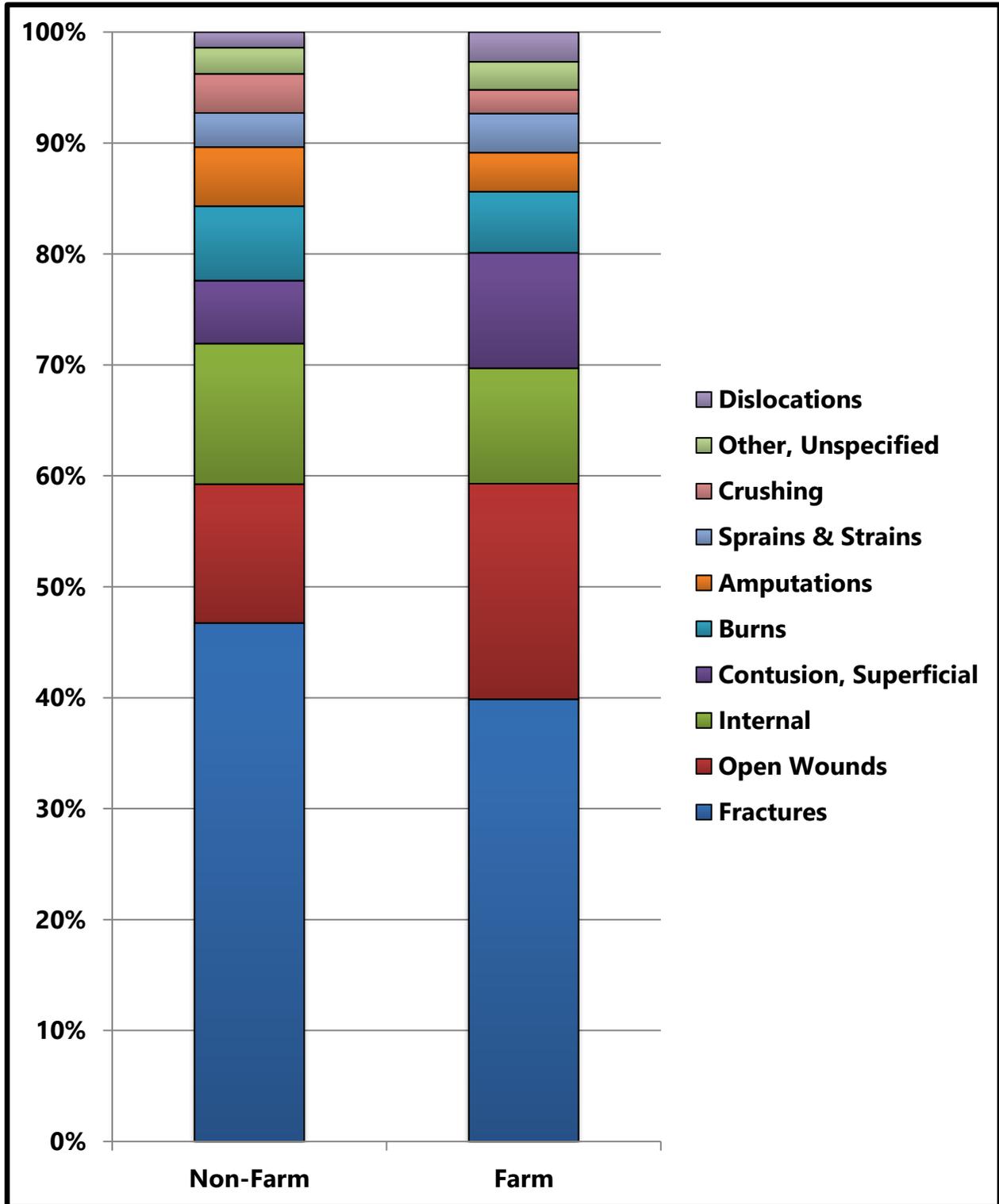
**Figure 24: Work-related Injuries reported through the Iowa Trauma Registry: 5-Year Number of Injuries by Primary Diagnosis, 2009-2013**



**Figure 25: Work-related Injuries reported through the Iowa Trauma Registry: Percent by Farm and Non-Farm, Primary Diagnosis of Injuries, 2009-2013**



**Figure 26: Work-related Injuries reported through the Iowa Trauma Registry: Primary Diagnosis of Injuries by Percent of Farm or Non-Farm, 2009-2013**



**Table 16: Work-related Injuries reported through the Iowa Trauma Registry: Farm and Non-Farm-Related Work Injuries by External Cause of Injury, 2009-2013**

External Cause of Injury	Total ITR		Farm		Non-Farm		Percent of All	
	Number	Percent All	Number	Percent of Farm	Number	Percent Of Non-Farm	Farm	Non-Farm
Falls	1682	33.2%	256	19.7	1426	37.9	5.1%	28.1%
Fire, Flames, Explosions	91	1.8%	35	2.7	56	1.5	0.7%	1.1%
Transportation Incidents	727	14.4%	200	15.4	527	14.0	3.9%	10.4%
Nature, Environment	191	3.8%	160	12.3	31	0.8	3.2%	0.6%
Other	2375	46.9%	651	50.0	1724	45.8	12.9%	34.0%
<b>Total</b>	<b>5066</b>	<b>100%</b>	<b>1302</b>	<b>100%</b>	<b>3764</b>	<b>100%</b>	<b>25.7%</b>	<b>74.3%</b>

Table 16: Transportation incidents include air and space, motor vehicle incidents, other road vehicles, railway incidents, vehicle not elsewhere classifiable, and water transport. The 'Other' category includes activity, homicide or violence, late effects, legal, poisoning, self-inflicted, suffocation, adverse effects in therapeutic use, undetermined, war, and other not specified.

**Figure 27: Work-related Injuries reported through the Iowa Trauma Registry: Farm compared to Non-Farm-Related Work Injuries by External Cause, 2009-2013**

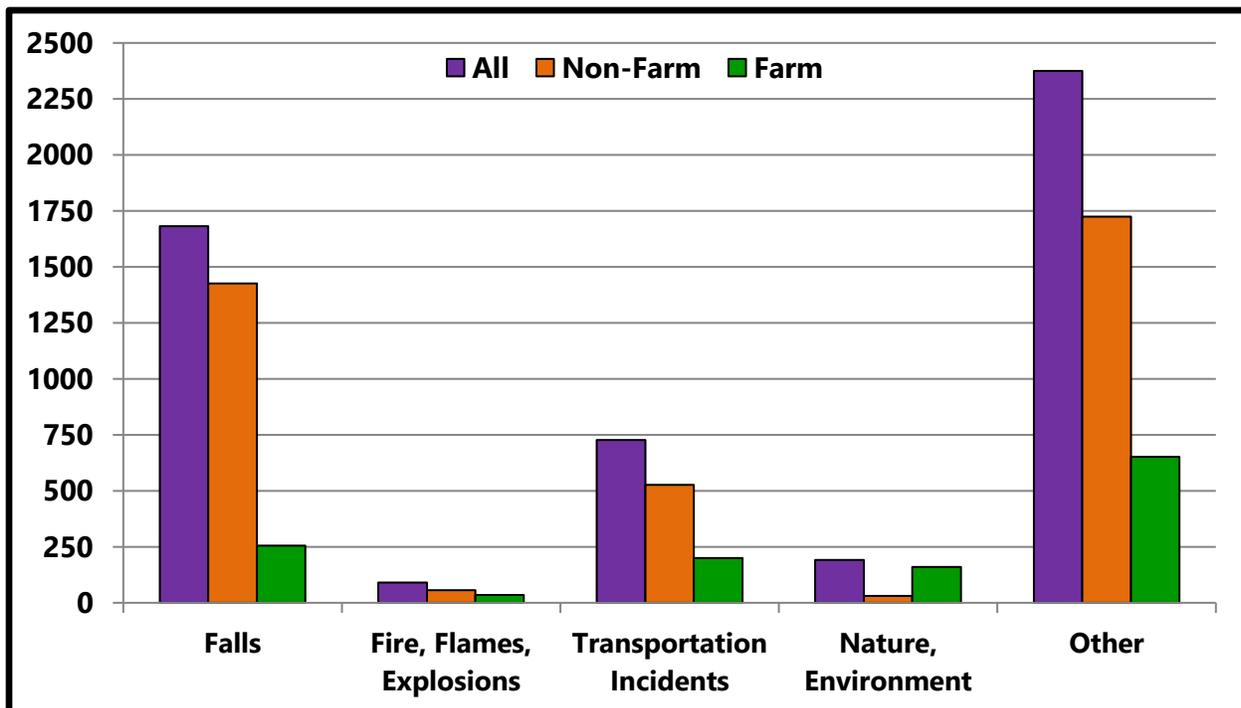
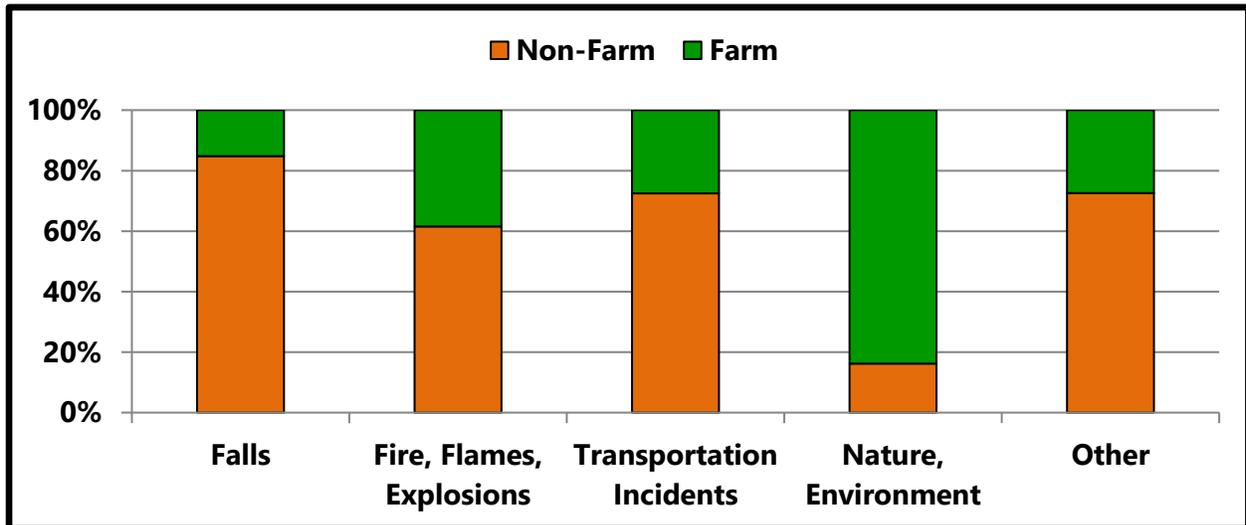
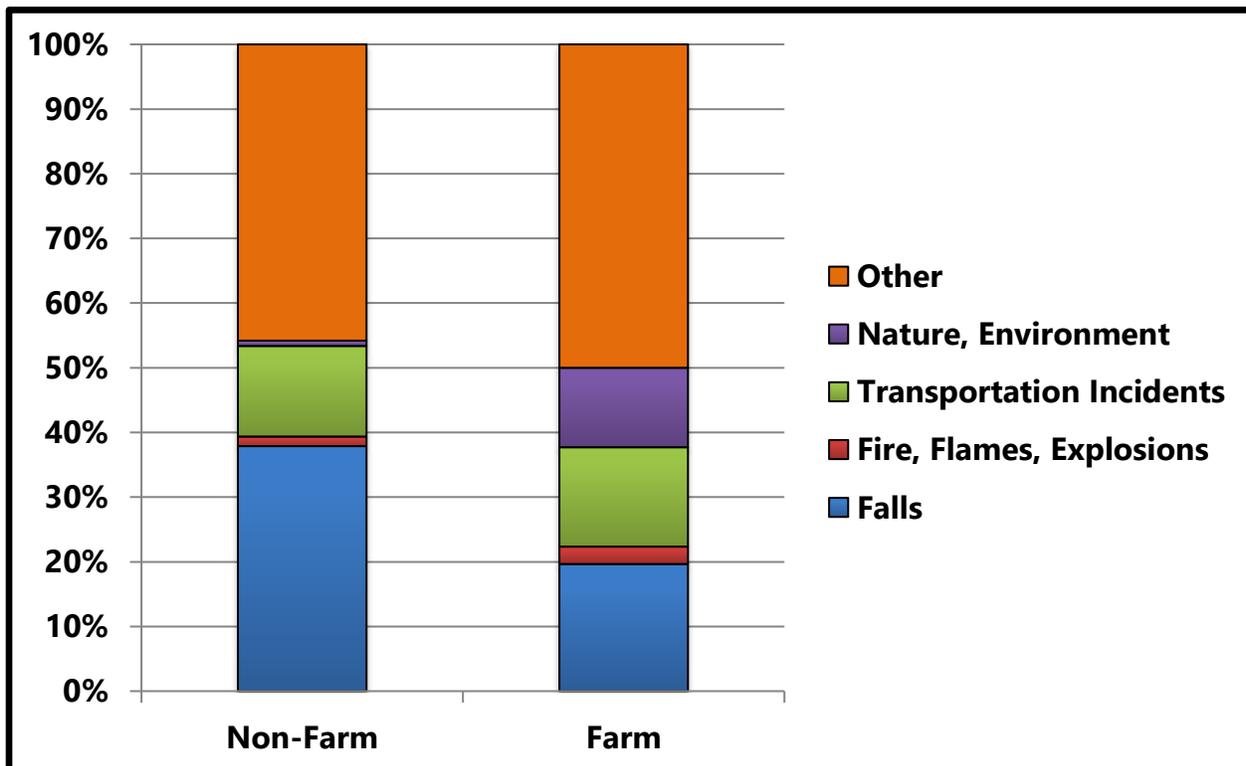


Figure 27: As seen in the hospital discharge data set, the large number of injuries classified as other possibly reflects a need for improved data collection and external cause of injury coding.

**Figure 28: Work-related Injuries reported through the Iowa Trauma Registry: Percent by Farm and Non-Farm, External Cause of Injuries, 2009-2013**



**Figure 29: Work-related Injuries reported through the Iowa Trauma Registry: External Cause of Injuries by Percent of Farm or Non-Farm, 2009-2013**



## Occupational Health Indicator Data

Occupational health indicators (OHI) are measures of health (work-related disease or injury) or factors associated with health (workplace exposures, hazards, or interventions) that allow a state to compare its health or risk status with that of other states and evaluate trends over time. These data can help guide priorities for prevention and intervention efforts. The indicators represent the consensus view of state and NIOSH representatives. They are a subset of the conditions recommended for surveillance in a 2001 OH subcommittee report on draft profiles for priority conditions to be placed under surveillance as part of state-based surveillance systems. The indicators are intended to be used in conjunction with other guidelines for state-based surveillance of occupational injuries and illnesses and to be used as a complement to overall state and national goals to improve the health of the population. (Reference: [Council of State and Territorial Epidemiologists Occupational Health subcommittee webpage for Occupational Health Indicators](#), accessed June 2016). As a state-based surveillance program receiving funding from NIOSH, the Iowa Occupational Health and Safety Surveillance Program annually calculates the OHI for Iowa per methodologies agreed upon by the CSTE Occupational Subcommittee OHI Workgroup. Selected data is shown in this report.

**Table 17: Iowa OHI: Estimated Workers legally covered by Workers' Compensation and Benefits Paid, 2009-2013**

	<b>Iowa Workers (in thousands)</b>	<b>Iowa Workers Covered WC* (in thousands)</b>	<b>Total Workers' Compensation Benefits Paid*</b>	<b>Total WC Benefits Paid Cost/covered worker</b>
<b>2013</b>	<b>1,600</b>	<b>1,464</b>	<b>\$668,646,000</b>	<b>\$457</b>
<b>2012</b>	<b>1,560</b>	<b>1,443</b>	<b>\$659,408,000</b>	<b>\$457</b>
<b>2011</b>	<b>1,570</b>	<b>1,419</b>	<b>\$621,556,000</b>	<b>\$438</b>
<b>2010</b>	<b>1,571</b>	<b>1,402</b>	<b>\$563,025,000</b>	<b>\$402</b>
<b>2009</b>	<b>1,581</b>	<b>1,415</b>	<b>\$552,753,000</b>	<b>\$391</b>

\*Data source: National Academy of Social Insurance (NASI) annual reports. Workers covered by workers' compensation includes those eligible or required to be covered, regardless of whether or not they are covered by an employer's policy.

**Table 18: Iowa OHI: Estimate of Occupational Injuries and Illnesses reported by Employers, 2009-2013**

	Iowa Workers	Total Recordable Injuries (BLS SOII)	Total Recordable Injuries Requiring Day(s) away from Work (BLS SOII)	Fatal Occupational Injuries (BLS CFOI)
<b>2013</b>	<b>1,600,000</b>	<b>574,000</b>	<b>138,000</b>	<b>72</b>
<b>2012</b>	<b>1,560,000</b>	<b>540,000</b>	<b>136,000</b>	<b>97</b>
<b>2011</b>	<b>1,570,000</b>	<b>499,000</b>	<b>151,000</b>	<b>93</b>
<b>2010</b>	<b>1,571,000</b>	<b>525,000</b>	<b>156,000</b>	<b>77</b>
<b>2009</b>	<b>1,581,000</b>	<b>573,000</b>	<b>158,000</b>	<b>80</b>

Data Sources: BLS Census of Fatal Occupational Injuries (CFOI), BLS Survey of Occupational Injuries and Illnesses (SOII - does not include farms with fewer than 11 employees).

**Figure 30: Rate of Fatal Occupational Injuries per 100,000 FTE, Iowa and U.S.A.**

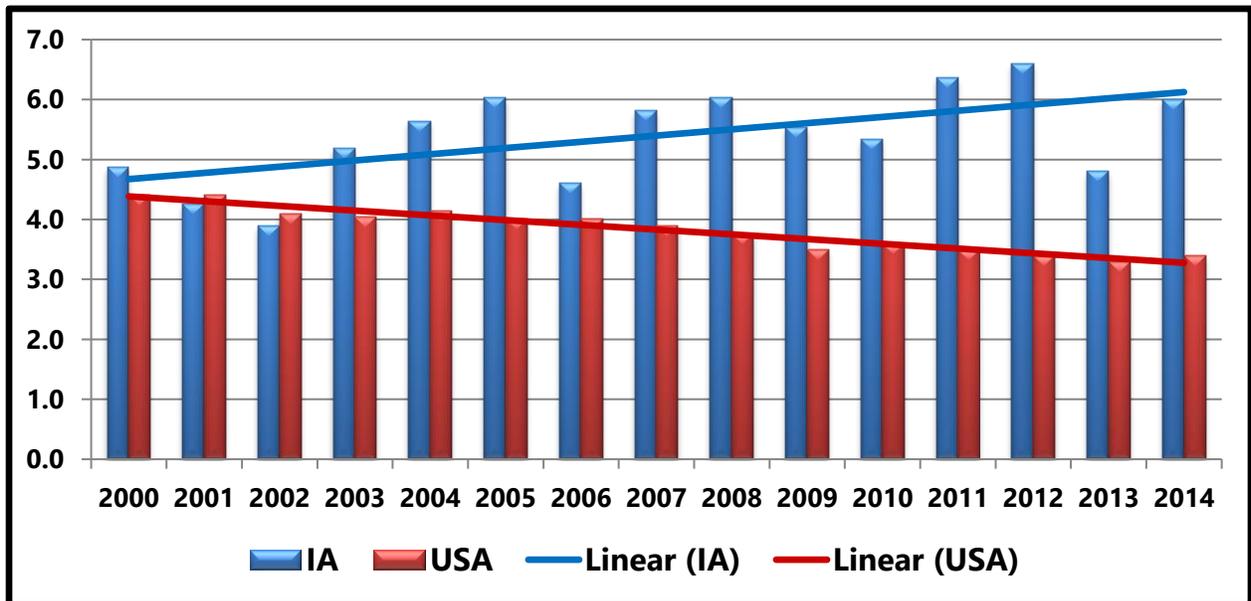
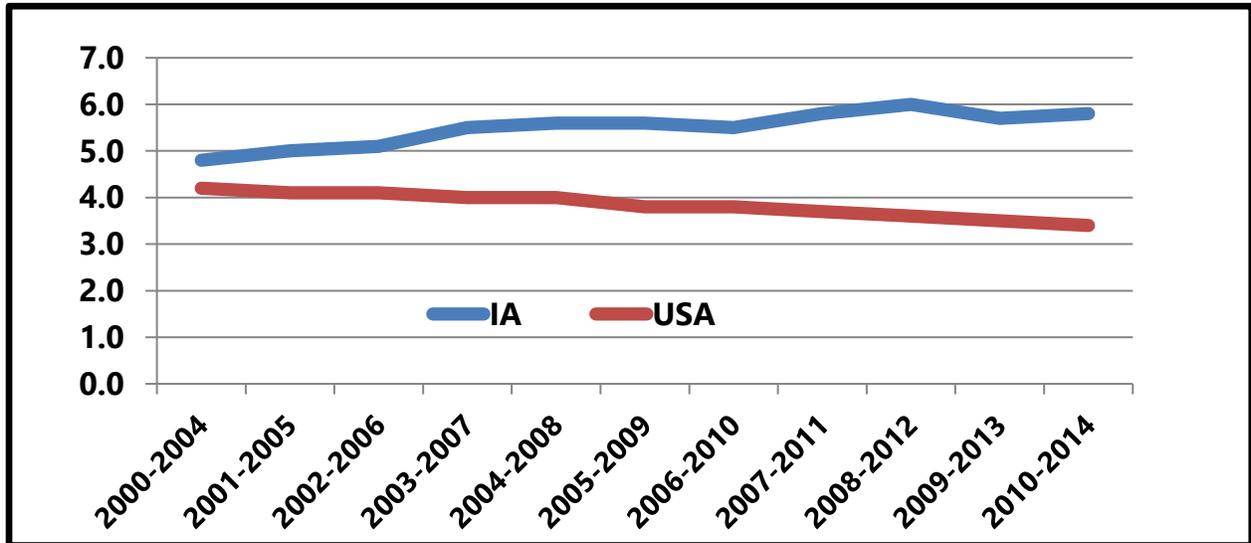


Figure 30: Data Source: US Bureau of Labor Statistics Census of Fatal Occupational Injuries (CFOI) Data. CFOI data does not include injuries obtained during normal commuting to and from the work site, or deaths from non-traumatic sources. The Iowa rate varies by year, but is seen to be on an upward slope for the years included in this data. The US rate

demonstrates fewer large variations due to the size of the data set, but has been on a declining slope.

Note: An updated version of this chart showing rates through 2016 is provided in Appendix 1 to show current fatality trends in Iowa at the time of this report’s release.

**Figure 31: Five-Year Rolling Average Rates of Fatal Work Injuries per 100,000 FTE workers, Iowa and the U.S.A.**



### Worker Age and Fatal Injury Analysis

**Table 19: Five-Year Average number of Iowa Full-time Equivalent Workers, Occupational Injury Deaths, and Rates per 100,000 FTE workers by Age Range, 2009-2013**

Age Group	5 yr. Ave Number of Workers	5 yr. Ave Number of Deaths	5 yr. Ave death rates
16-19	37,497	0.6	1.6
20-24	134,008	2.4	1.8
25-34	313,742	12.6	4.0
35-44	316,509	10.8	3.4
45-54	376,712	18.6	4.9
55-64	268,589	17.4	6.5
65+	60,153	19.4	32.3
<b>Totals</b>	<b>1,507,210</b>	<b>81.8</b>	<b>5.4</b>

**Figure 32: Five-Year Average Rate of Fatal Occupational Injuries per 100,000 FTE workers by Age Range, Iowa and USA, 2009-2013**

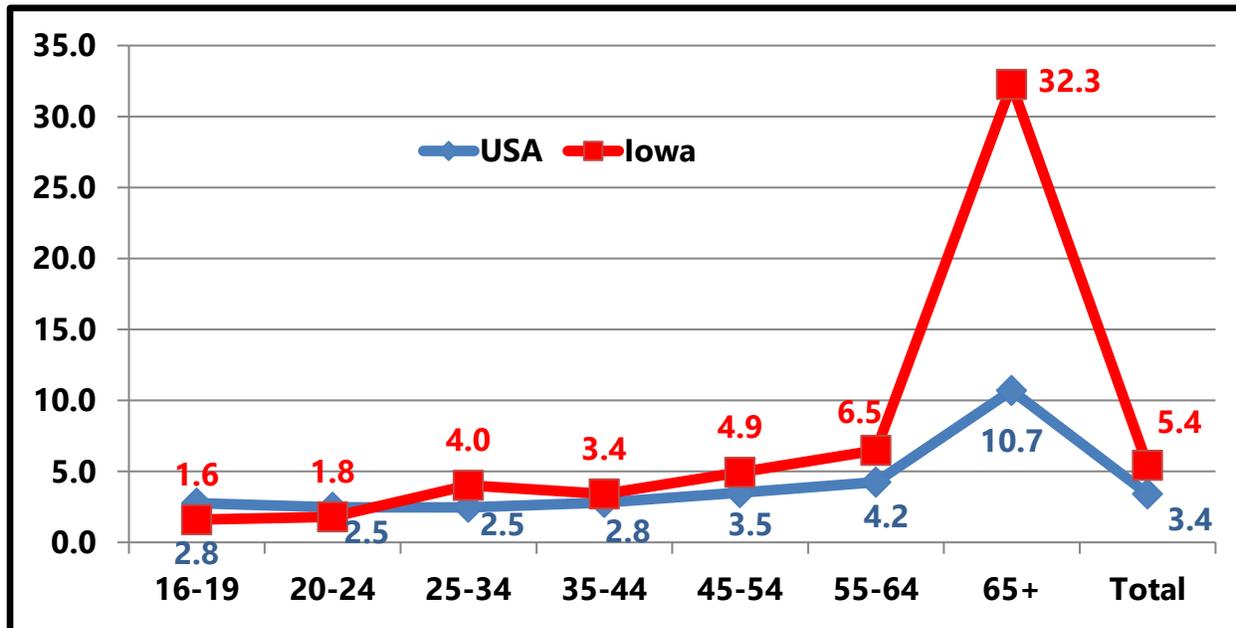


Figure 32: While it is not uncommon to have higher rates of fatal occupational injuries in older workers, in Iowa the rate is about 0.5 times higher for workers in the 55-64 age range compared to all USA worker fatalities, and three times higher for workers 65 years of age or older. Overall, Iowa has more high-risk occupations and industries than the USA average. However, as shown below in Table OH17, the percentage of workers by age range does not significantly differ between the USA and Iowa.

**Table 20: Five-Year Average Percentage FTE workers by Age Range, Iowa and USA, 2009-2013**

Workers by Age Range	% of USA Workforce	% of Iowa Workforce
16-19	2%	2%
20-24	8%	9%
25-34	22%	21%
35-44	23%	21%
45-54	25%	25%
55-64	16%	18%
65+	4%	4%

**Figure 33: Iowa Five-Year Average Percentage of Total Fatal Injuries by Age Range compared to Percentage of Iowa Workforce by Age Range, 2009-2013**

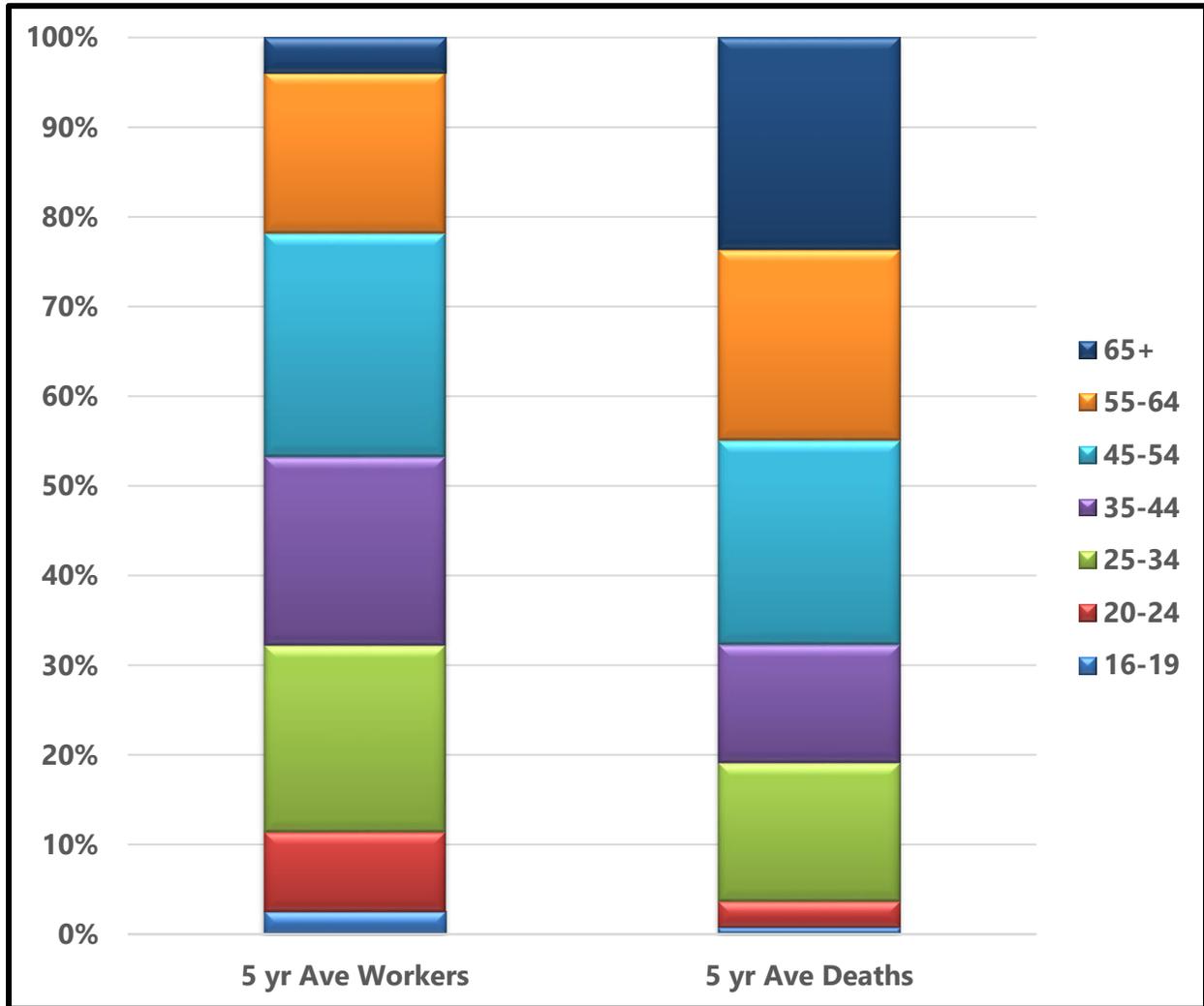


Figure 33: While workers in Iowa 45 years of age or older account for 47% of the workforce, they averaged 68% of the occupational fatal injuries from 2009 through 2013. Workers 55 years of age or older made up 22% of the workforce, but almost 38% of the fatalities. BLS CFOI fatality data.

**Figure 34: Percentage of Younger Worker Fatal Occupational Injuries compared to Older Worker Fatal Injuries, Iowa and USA, Five-Year Average, 2009-2013**

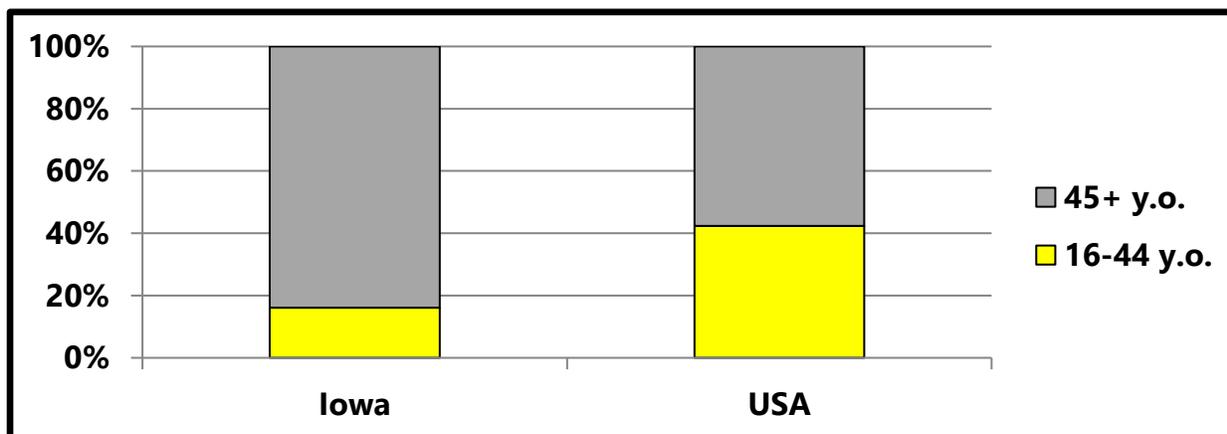


Figure 34 demonstrates that a greater percentage of older Iowa workers (45 years of age or older) die by occupational injuries than is observed for all USA workers.

### Worker Status and Fatal Injury Analysis

**Table 21: Occupational Fatal Injuries by Employment Status, USA and Iowa, 2009-2013**

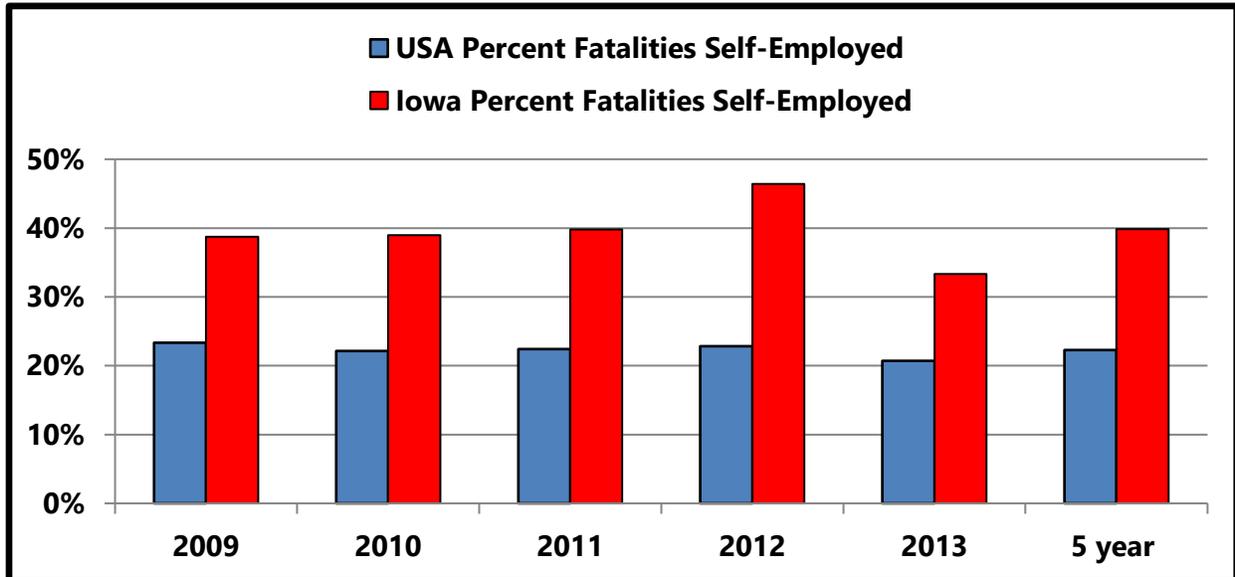
USA	2009	2010	2011	2012	2013	5 year
Wage and salary workers*	3488	3651	3642	3571	3635	17987
Self-employed**	1063	1039	1051	1057	950	5160
Percent Fatalities Self-Employed	23%	22%	22%	23%	21%	22%
Iowa	2009	2010	2011	2012	2013	5 year
Wage and salary workers*	49	47	56	52	48	252
Self-employed**	31	30	37	45	24	167
Percent Fatalities Self-Employed	39%	39%	40%	46%	33%	40%

Table Data source: BLS CFOI

\* May include volunteers and workers receiving other types of compensation.

\*\*Includes self-employed workers, owners of unincorporated businesses and farms, paid and unpaid family workers, and may include some owners of incorporated businesses or members of partnerships.

**Figure 35: Percentage of Occupational Fatal Injuries by Year where Employment Status, was classified as Self-Employed\*\*, 2009-2013**



Data source BLS CFOI: \*\*Includes self-employed workers, owners of unincorporated businesses and farms, paid and unpaid family workers, and may include some owners of incorporated businesses or members of partnerships.

Table 21, Figure 35: A larger percentage of self-employed worker fatal injuries occur in Iowa than in the USA. This indicator may be a major contributor to higher overall Iowa fatality rates, including older worker rates. This is an area of interest for additional research by the IDPH OHSSP, including improved surveillance, data analysis regarding specific risks and populations, and identification of possible intervention and awareness activities to address this disparity for Iowa workers.

Self-employment is a risk factor for occupational fatalities in Iowa. The Bureau of Labor Statistics looked at this issue and published a journal article\* in 2004 which found:

*"The disparity in fatalities and fatality rates between self-employed workers and wage and salary workers is attributable mainly to two factors: (1) self-employed workers are more likely to work in industries and occupations with higher fatality rates; and (2) when the two categories of workers are in the same occupation, self-employed workers have certain characteristics that make them more likely than wage and salary workers to suffer a fatal injury."*

\*Pegula, Stephen M. "Occupational fatalities: self-employed workers and wage and salary workers." [Monthly Labor Review \(March 2004\): Vol. 127 Issue 3, p30](#). Online access June 2016.

**Workforce Industry Overview and Worker Fatalities by Industry Analysis****Table 22: Iowa Workforce Full-Time Equivalent Workers by Industry Sector, 2009-2013**

<b>Industry Sectors</b>	<b>2009 Workers</b>	<b>2010 Workers</b>	<b>2011 Workers</b>	<b>2012 Workers</b>	<b>2013 Workers</b>	<b>5 yr. Ave</b>	<b>Pct. Work force</b>
Agriculture, Forestry, Fishing, Hunting	77,454	63,807	71,988	72,282	74,738	72,054	<b>4.8%</b>
Construction	83,725	104,840	99,675	83,601	94,032	93,175	<b>6.2%</b>
Manufacturing	263,605	241,308	248,621	266,407	258,418	255,672	<b>17.0%</b>
Wholesale Trade	41,180	45,533	46,994	37,133	35,713	41,311	<b>2.7%</b>
Retail Trade	154,351	161,630	170,792	165,002	162,097	162,774	<b>10.8%</b>
Transportation & Warehousing	71,171	77,380	67,494	65,993	63,768	69,161	<b>4.6%</b>
Professional & Business Services	116,319	105,635	109,126	107,732	114,691	110,701	<b>7.3%</b>
Education, Health Care, Social Assistance	314,941	315,403	326,780	338,596	349,412	329,026	<b>21.8%</b>
Leisure and Hospitality	100,861	90,111	84,493	86,466	104,243	93,235	<b>6.2%</b>
Other Services (not Public Admin)	62,160	67,670	59,238	64,356	56,111	61,907	<b>4.1%</b>
Government (Public Admin)	53,776	59,195	49,504	55,157	51,951	53,917	<b>3.6%</b>
Mining, Utilities, Information, Financial Combined	153,701	156,015	167,516	166,846	177,316	164,279	<b>10.9%</b>
<b>Total FTE</b>	<b>1,493,244</b>	<b>1,488,527</b>	<b>1,502,221</b>	<b>1,509,571</b>	<b>1,542,490</b>	<b>1,507,211</b>	<b>100%</b>

**Figure 36: Percent of Iowa Workforce FTE by Industry Sector, 2009-2013**

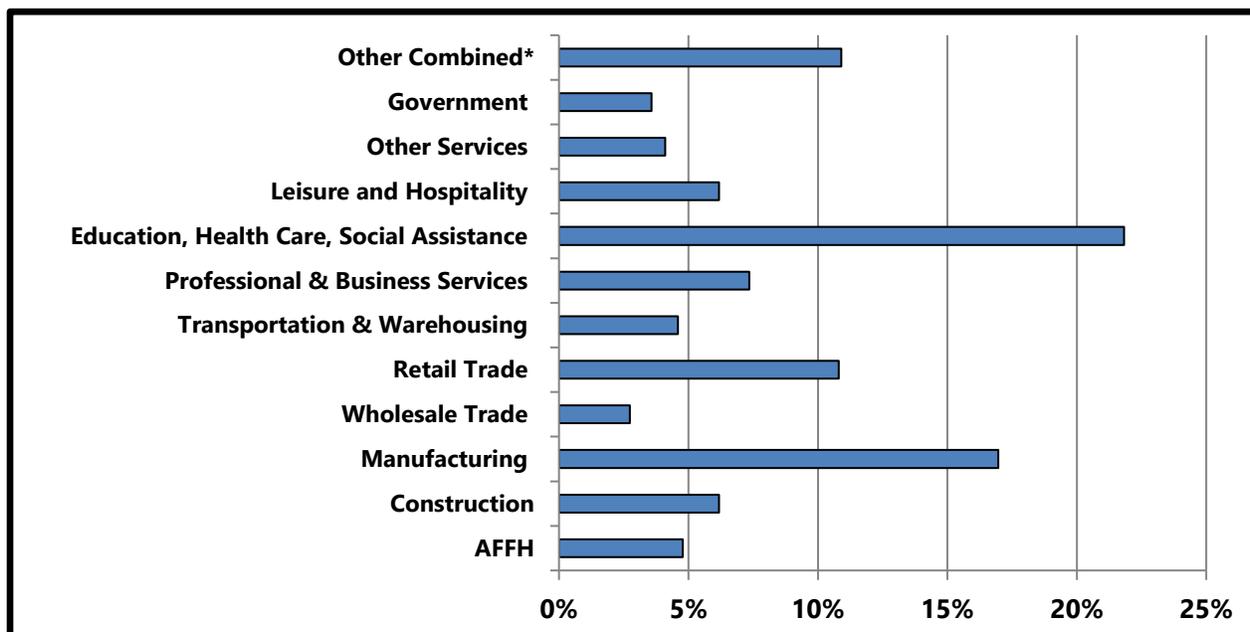
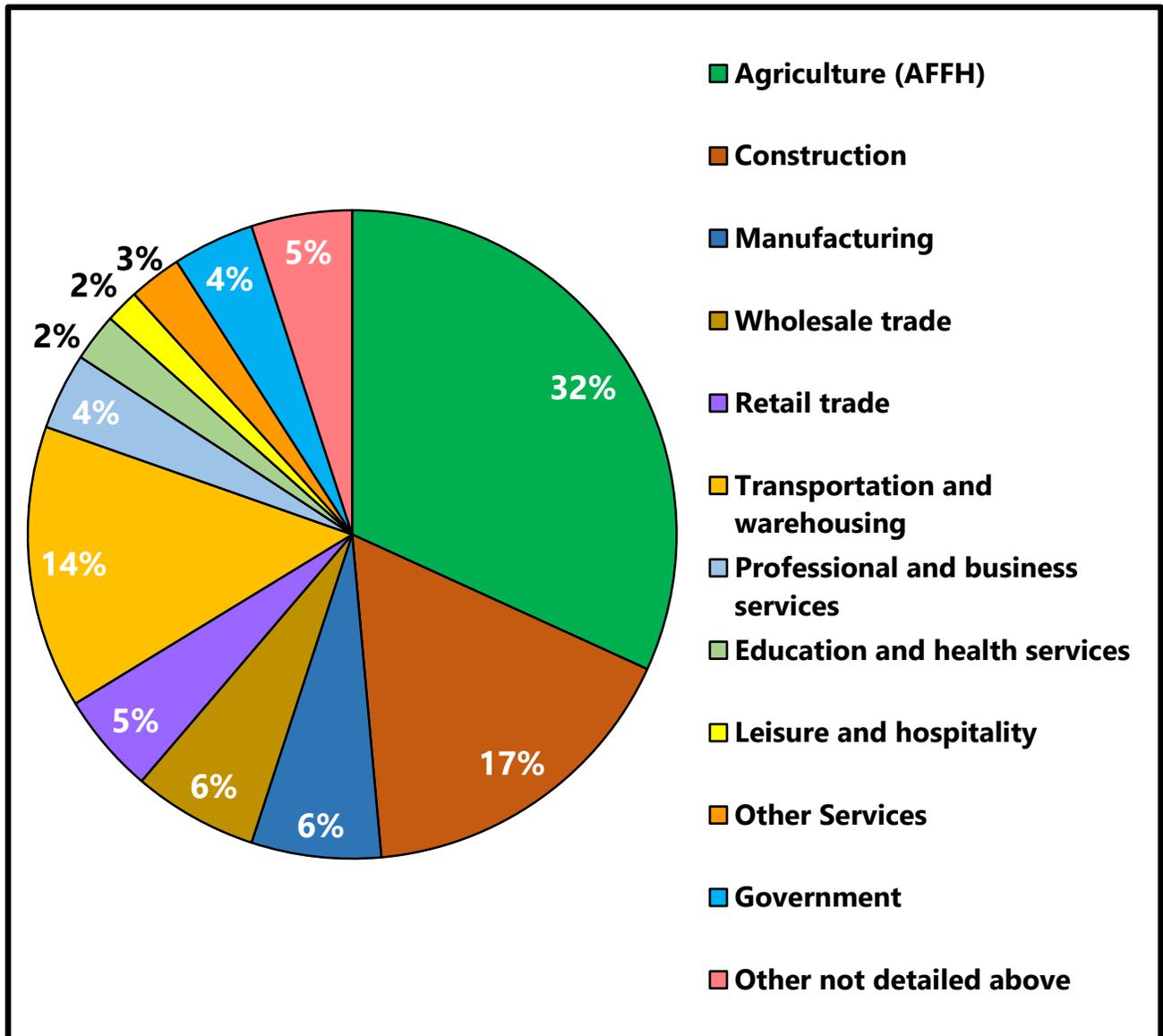


Figure 36: AFFH stands for Agriculture, Forestry, Fishing, and Hunting; 'Other Combined' includes Mining, Utilities, Information, and Financial Sectors.

**Table 23: Census of Fatal Occupational Injuries, Iowa Deaths by Major Industry Sector, 2009-2013**

Major Industries Fatality Data IA	2009	2010	2011	2012	2013	5 yr. Total	5 yr. Ave	Pct. of Total
<b>Total Fatalities</b>	<b>80</b>	<b>77</b>	<b>93</b>	<b>97</b>	<b>72</b>	<b>419</b>	<b>84</b>	<b>100%</b>
Agriculture (AFFH)	25	21	27	38	22	133	27	32%
Construction	15	14	15	14	12	70	14	17%
Manufacturing	5	6	6	5	5	27	5	6%
Wholesale trade	7	6	4	5	4	26	5	6%
Retail trade	3	7	2	6	3	21	4	5%
Transportation and warehousing	12	8	16	14	9	59	12	14%
Professional and business services	0	6	3	3	4	16	3	4%
Education and health services	3	0	1	3	3	10	2	2%
Leisure and hospitality	0	0	2	2	3	7	1	2%
Other Services	0	3	3	1	4	11	2	3%
Government	4	0	10	1	2	17	3	4%
Other not detailed above	6	6	4	4	1	21	4	5%

**Figure 37: Census of Fatal Occupational Injuries, Iowa Deaths by Major Industry Sector, 2009-2013**



**Figure 38: Iowa Comparison of Percentage Workforce and Percentage of Occupational Fatal Injuries by Industry, 2009-2013**

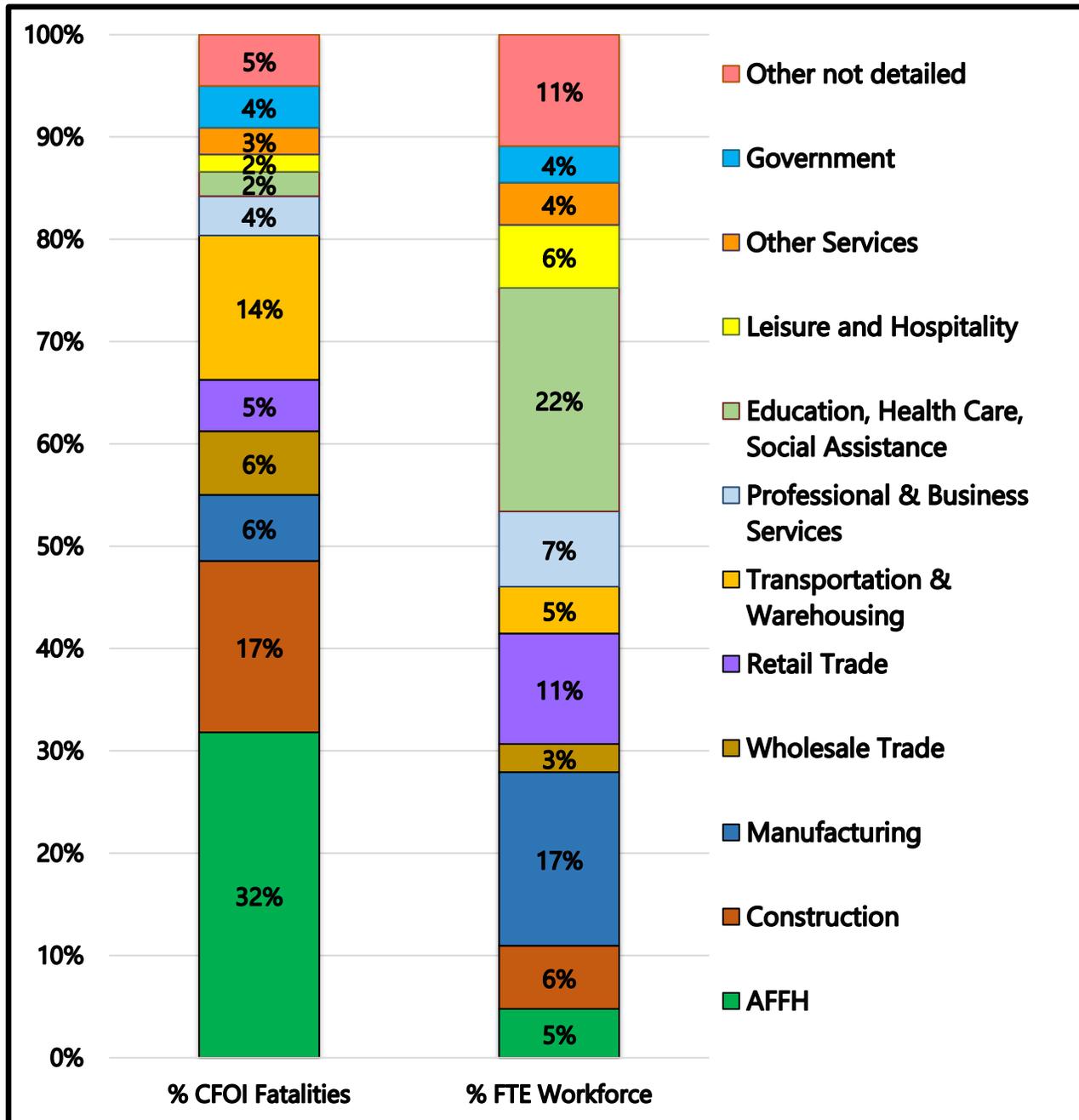


Figure 38: Iowa has significant disparities in the distribution of risk across worker industries. Agricultural workers accounted for 5% of the workforce but 32% of the fatal injuries. Construction workers were 6% of the Iowa workforce but 17% of the fatal injuries. Together, 11% of the average Iowa workforce from 2009 through 2013 experienced 49% of the work-related injury deaths. CFOI fatalities do not include worker commuting deaths.

## Appendix 1: Fatal Occupational Injury Data through 2016

CFOI fatality data from 2000 and including 2014-2016 are shown below in Figure A1.1 and A1.2. These updated data depictions were released in February 2018 to better represent current fatality trends in Iowa.

**Figure A1.1: Rate of Fatal Occupational Injuries per 100,000 FTE, Iowa and USA, 2000-2016**

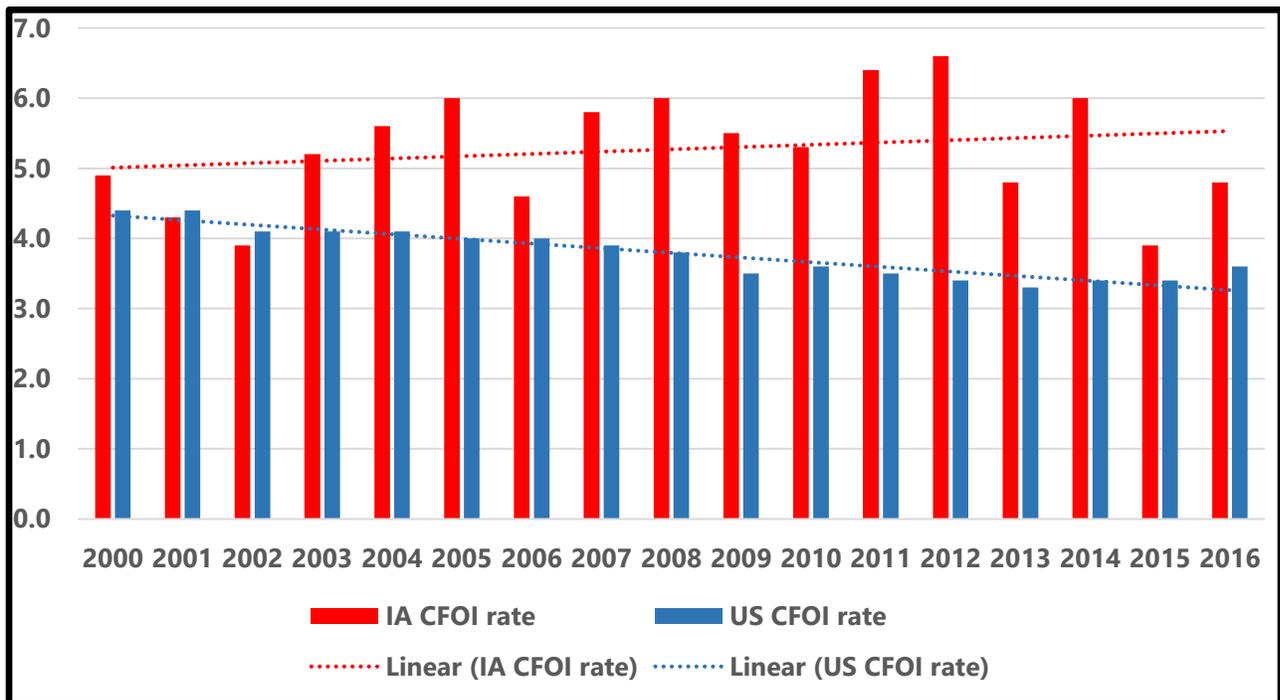


Figure A1.1: Data Source: U.S. BLS Census of Fatal Occupational Injuries (CFOI) data. CFOI data does not include injuries obtained during normal commuting to and from the work site, or deaths from non-traumatic sources. The Iowa rate fluctuates by year and was showing an upward linear trend through 2013, although the 5-year rolling average rates are showing a decrease (Figure A1.2). The U.S. rate demonstrates fewer large variations due to the larger size of the data set, but has been on a declining trend.

**Figure A1.2: Five-Year Rolling Average Comparison of Occupational Fatal Injury Rates per 100,000 FTE, Iowa and USA, 2000-2016**

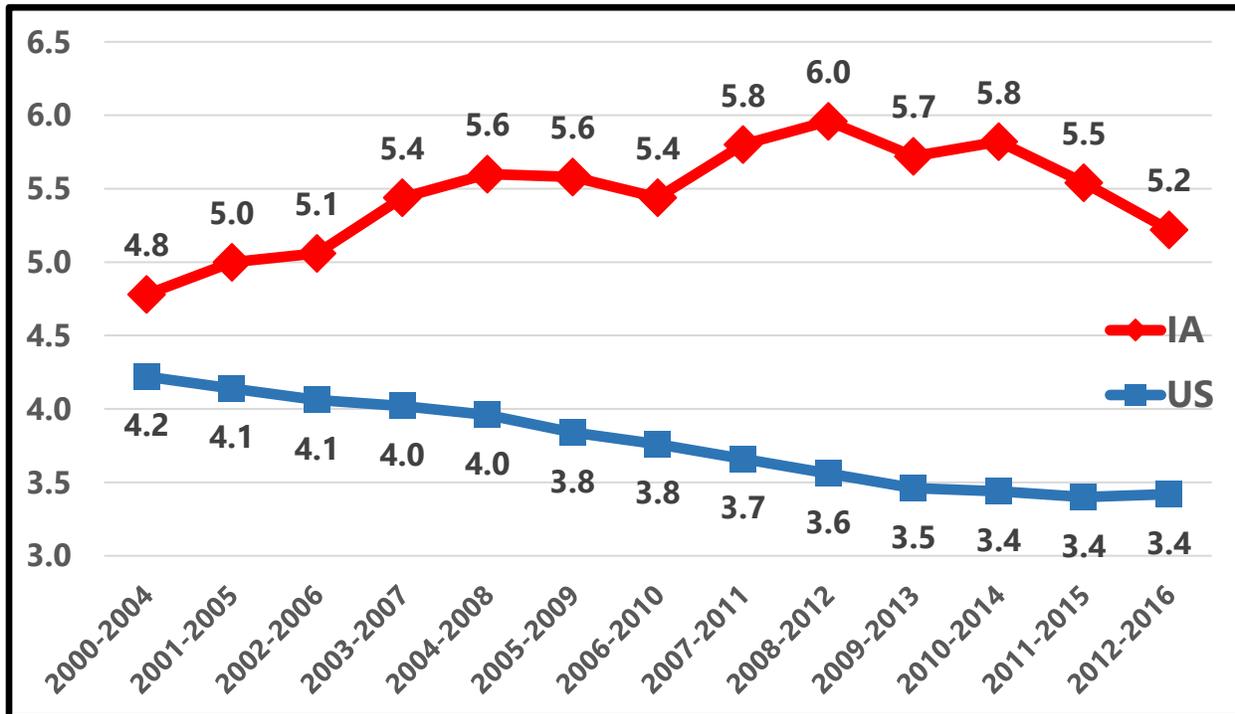


Figure A1.2: The five-year rolling average comparison depicted in this chart is used as an ongoing progress measure *in the Healthy Iowans 2017-2021* state plan which can be found at [Healthy Iowans](#). The objective is to reduce the 5-year rolling average rate of fatal occupational injuries in Iowa from 5.8/100,000 FTE (2010-2014) to no more than the national 2010-2014 base rate of 3.4/100,000 FTE by 2020.

## Appendix 2: Technical notes

### Barell Injury Diagnosis Code Matrix (condensed)

Diagnosis	ICD-9 Codes Included in Query
Fracture	800-829
Dislocation	830-839
Sprains & Strains	840-848
Internal	850-854, 860-869, 952, 995.55
Open Wound	870-884, 890-894
Amputations	885-887, 895-897
Blood Vessels	900-904
Contusion, Superficial	910-924
Crush	925-929
Burns	940-949
Nerves	950-951, 953-957
Unspecified	959
Traumatic Brain Injury	800, 801, 803, 804 (.01, .02- .06, .09, .1-.4, .50-.9), 850 (.1-.5, .9), 851-854, 950 (.1-.3), 995.55

Reference: CDC National Center for Health Statistics Injury Statistics Barell Matrix:

[https://www.cdc.gov/nchs/injury/ice/barell\\_matrix.htm](https://www.cdc.gov/nchs/injury/ice/barell_matrix.htm) and the Barell Injury Diagnosis Matrix,

Classification by Body Region and Nature of the Injury

[https://www.cdc.gov/nchs/data/ice/final\\_matrix\\_post\\_ice.pdf](https://www.cdc.gov/nchs/data/ice/final_matrix_post_ice.pdf)

### Injury Categorization

The following injury categories were used for data preparation for this report unless designated:

- Road Traffic (Motor vehicle traffic)\* – any vehicle incident occurring on a public highway, street, or road (i.e., originating on, terminating on, or involving a vehicle partially on the highway).
- Firearm\*– a penetrating force injury resulting from a bullet or other projectile shot from a powder-charged gun. This category includes gunshot wounds from powder-charged handguns, shotguns, and rifles.
- Poisoning\* – ingestion, inhalation, absorption through the skin, or injection of so much of a drug, toxin (biologic or non-biologic), or other chemical that a harmful effect results, such as drug overdoses.

- Fall\* – an injury received when a person descends abruptly due to the force of gravity and strikes a surface at the same or lower level.
- Suffocation\* – inhalation, aspiration, or ingestion of food or other object that blocks the airway or causes suffocation; accidental mechanical suffocation due to hanging, strangulation, or lack of air in a closed place, plastic bag or falling earth.
- Drowning\* – suffocation (asphyxia) resulting from submersion in water or another liquid.
- Fire/Burn\* – severe exposure to flames, heat, or chemicals that leads to tissue damage in the skin or deeper in the body.
- Cut/Pierce\* – an injury resulting from an incision, slash, perforation, or puncture by a pointed or sharp instrument, weapon, or object.
- Struck by/Against\* – an injury resulting from being struck by (hit) or crushed by a human, an animal, or an inanimate object or force other than a vehicle or machinery; injury caused by striking (hitting) against a human, animal, or inanimate object or force other than a vehicle or machinery.
- Machinery\* – an injury that involves operating machinery, such as drill presses, forklifts, large power-saws, jack hammers, and commercial meat slicers.
- Other Pedal Cycle – an injury that involves riders of unicycles, bicycles, tricycles, mountain bikes, and other non-motorized pedal cycles (non-traffic).
- Other Transportation\* – an injury to a person boarding, alighting, or riding in or on all other transport vehicles involved in a collision or other event with another vehicle, pedestrian, or animal not described in MVT. This category includes railway, water, air, space, animal and animal-drawn conveyances (e.g., horseback riding), ATVs, battery-powered carts, ski lifts, and other cable cars not on rails.
- Natural/Environmental \*– an injury resulting from exposure to adverse natural and environmental conditions (such as severe heat, severe cold, lightning, sunstroke, large storms, and natural disasters) as well as lack of food or water.
- Overexertion\* – working the body or a body part too hard, causing damage to muscle, tendon, ligament, cartilage, joint, or peripheral nerve (e.g., common cause of strains, sprains, and twisted ankles). This category includes overexertion from lifting, pushing, or pulling or from excessive force.
- Other Specified\* – an injury that does not fit another category. Some examples include causes such as electric current, electrocution, explosive blast, fireworks, overexposure to radiation, welding flash burn or animal scratch.
- Not Elsewhere Classified\* – includes other environmental and accidental causes or late effects of other accidents.
- Not Specified – injuries with insufficient information to code.

- Suicide\* – an injury or poisoning resulting from a deliberate violent act inflicted on oneself with the intent to take one's own life or harm oneself. This category also includes suicide attempts and other intentional self-harm.
- Homicide\* – an injury from an act of violence where physical force by one or more persons is used with the intent of causing harm, injury, or death to another person; or an intentional poisoning by another person.
- Unknown Intent – injuries of all causes for which intent could not be determined.

\*Definitions from Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control (NCIPC) WISQARS™ (Web-based Injury Statistics Query and Reporting System). This list was compiled by the UI IPRC.

## Data Sources and Methodologies

**Numerator data sources** used in this report were comprised of Death Certificate Data Inpatient Hospital Discharge Data, Bureau of Labor Standards Census of Fatal Occupational Injuries data, and Iowa Trauma Registry Data. Data sources for Iowa Occupational Health Indicator calculations vary and are described below.

**1. Death Certificate data:** The Bureau of Vital Statistics at the Iowa Department of Public Health collects and compiles Iowa residents' death certificates, which are classified by external cause of death. In compliance with the CDC recommendations, this report used the underlying-cause-of-death field to identify the injury deaths (decedents that had an external cause of death code based on ICD-10 (International Classification of Diseases-10th Revision). In addition, the other conditions field was searched only for Traumatic Brain Injury (TBI). The underlying cause of death is defined as "the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury<sup>11</sup>".

**2. Hospital Discharge Data (Inpatient):** Iowa's 2009-2013 State Inpatient Database (SID) was used to compute CDC-recommended injury indicators. The CDC recommends using the principal diagnostic field to identify injury hospitalizations and searching all the other diagnostic fields to select the External cause of injury codes (E- codes). The injury and external cause of injury codes were classified according to the 9th Revision of the International Classification of Diseases Clinical Modification (ICD-9-CM). Data for hospitalizations include only the first hospitalization for each injury.

**3. Iowa Trauma Data Registry:** The Iowa Department of Public Health hosts a statewide trauma patient registry. The registry is a web-based system used to collect specific information about patients that have experienced significant traumatic events. All

hospitals in Iowa are required to report these data elements. Please note that in this report, data from the trauma registry is not population based; thus, only percentages were calculated instead of rates.

**4. Iowa Occupational Health Indicators:** Occupational health indicators (OHI) are measures of health (work-related disease or injury) or factors associated with health (workplace exposures, hazards, or interventions) that allow a state to compare its health or risk status with that of other states and evaluate trends over time. The IDPH Occupational Health and Safety Surveillance Program (OHSSP), funded by a cooperative agreement from the National Institute for Occupational Health and Safety (NIOSH) annually calculates state OHI using standardized methodology compiled in a guidance document that is updated each spring. Numerator and denominator sources are listed for each indicator in this guidance document, which can be linked from <https://www.cste.org/group/OHIndicators>.

**Denominator data sources** include data from the Bureau of Labor Statistics (BLS) Current Population Survey (CPS) estimates of employed worker population estimates for workers greater than or equal to 15 years of age and U.S. Census data.

**1. BLS CPS data:** Estimates are based on a subset of the Bureau of Labor Statistics (BLS) Current Population Survey (CPS) public access data files maintained by the NIOSH Division of Safety Research (DSR), Surveillance and Field Investigation Branch (SFIB), Injury Surveillance Team (IST). The data is retrieved using an online tool called the Employed Labor Force (ELF) query system. The NIOSH ELF query system is based on a subset of CPS data that includes only those persons whose age is greater than or equal to 15 and who are classified as "Employed - At Work" or "Employed - Absent" according to the CPS monthly labor force variable. Estimates derived from this query system exclude unemployed workers and thus do not represent the total U.S. civilian labor force.

**2. Census data:** Census data is used as denominator data for the entire U.S. or State of Iowa population, including use for the calculation of age-adjusted rates.

#### **Data qualifiers**

Rates are reported as the annual average per 100,000 working population for 2009-2013 unless noted otherwise.

Data for hospitalizations include only the first hospitalization for each injury.

Information on injury deaths and hospitalizations are presented in this report. Death data are based on death certificates from the Iowa Department of Public Health and the

hospitalization data are from the Iowa Hospital Association hospital inpatient discharge data.

Only injury-related hospitalizations and deaths occurring within the state of Iowa are included in the data used for this report. Iowans may be hospitalized or die outside of Iowa, which excludes those injury numbers from the reported data. The impact from this limitation is unknown.

Additional information about the injury categorizations used for coding death data can be found at this ICD-10 external cause coding reference:

[www.cdc.gov/nchs/injury/injury\\_tools.htm/icd10\\_external.xls](http://www.cdc.gov/nchs/injury/injury_tools.htm/icd10_external.xls).

Additional information about the injury categorizations used for the hospitalization data can be found at this ICD-9 external cause coding reference:

[cdc.gov/nchs/injury/injury\\_tools.htm/icd9\\_external.xls](http://cdc.gov/nchs/injury/injury_tools.htm/icd9_external.xls).

### Appendix 3: Full-Time Equivalent Worker Estimates

Estimates are based on a subset of the Bureau of Labor Statistics (BLS) Current Population Survey (CPS) public access data files maintained by the NIOSH Division of Safety Research (DSR), Surveillance and Field Investigation Branch (SFIB), Injury Surveillance Team (IST). The data is retrieved using an online tool called the Employed Labor Force (ELF) query system. The NIOSH ELF query system is based on a subset of CPS data that includes only those persons whose age is greater than or equal to 15 and who are classified as "Employed - At Work" or "Employed - Absent" according to the CPS monthly labor force variable. Estimates derived from this query system exclude unemployed workers and thus do not represent the total U.S. civilian labor force.

**Table A: Full-Time Equivalent Worker Estimates for Iowa by Age Range, All Jobs, 5-Year Average, 2009-2013**

<b>Age (years)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>
<b>16-19</b>	37,498	19,993	17,505
<b>20-24</b>	134,009	68,873	65,136
<b>25-34</b>	313,741	180,553	133,188
<b>35-44</b>	316,509	181,481	135,028
<b>45-54</b>	376,713	209,859	166,854
<b>55-64</b>	268,589	150,529	118,060
<b>65-74</b>	50,126	29,826	20,300
<b>75+</b>	10,027	6,412	3,615
<b>Total</b>	1,507,211	847,525	659,686
<b>Race</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>
<b>White</b>	1,424,309	800,875	623,434
<b>Non-White</b>	82,904	46,651	36,253

**Table B: Full-Time Equivalent Worker Estimates for Iowa by Age Range, All Jobs, 3-Year Rolling Average, 2009-2013**

<b>Age (years)</b>	<b>2009-2011</b>	<b>2010-2012</b>	<b>2011-2013</b>
<b>16-19</b>	37,253	35,186	36,029
<b>20-24</b>	133,472	135,950	135,513
<b>25-34</b>	309,039	315,783	320,185
<b>35-44</b>	314,483	312,781	319,473
<b>45-54</b>	387,180	373,442	362,374
<b>55-64</b>	253,739	269,543	285,927
<b>65-74</b>	50,175	47,894	48,420
<b>75+</b>	9,320	9,532	10,178
<b>Total</b>	1,494,663	1,500,111	1,518,098

**Table C: Full-Time Equivalent Worker Estimates for Iowa Demographics, 3-Year Rolling Average, 2009-2013**

<b>Group</b>	<b>2009-2011</b>	<b>2010-2012</b>	<b>2011-2013</b>
<b>Male</b>	839,170	843,506	856,657
<b>Female</b>	655,493	656,605	661,442
<b>White</b>	1,420,432	1,420,336	1,429,386
<b>Non-White</b>	74,231	79,775	88,712
<b>Total</b>	1,494,663	1,500,111	1,518,098

## Appendix 4: Resources

2009 Burden of Injury in Iowa: <https://idph.iowa.gov/disability-injury-violence-prevention/injury-prevention>

Bureau of Labor Statistics, CFOI and SOII data: [www.bls.gov/iif/home.htm](http://www.bls.gov/iif/home.htm)

CDC Barell Injury Diagnosis Matrix: [www.cdc.gov/nchs/injury/ice/barell\\_matrix.htm](http://www.cdc.gov/nchs/injury/ice/barell_matrix.htm)

CDC NIOSH Employed Labor Force (ELF) Tool: [wwwn.cdc.gov/wisards/cps/](http://wwwn.cdc.gov/wisards/cps/)

CDC Injury Prevention & Control, Data & Statistics (WISQARS™) Matrix of E-code Groupings: [www.cdc.gov/injury/wisqars/ecode\\_matrix.html](http://www.cdc.gov/injury/wisqars/ecode_matrix.html)

CDC Employed Labor Force (ELF) Tool: <http://wwwn.cdc.gov/wisards/cps/>

United States Department of Agriculture (USDA) 2013 Urban Influence Codes: <http://www.ers.usda.gov/data-products/urban-influence-codes.aspx>

Iowa Department of Public Health: <https://idph.iowa.gov/>

- IDPH Division of Acute Disease Prevention, Emergency Response & Environmental Health: <https://idph.iowa.gov/ADPEREH>
- IDPH Division of Behavior Health: <https://idph.iowa.gov/bh>
- IDPH Healthy Iowans: <http://idph.iowa.gov/healthy-iowans>
- IDPH Occupational Health & Safety Surveillance Program: <https://idph.iowa.gov/Environmental-Health-Services/Occupational-Health-and-Safety-Surveillance>
- IDPH Trauma Data Registry: <https://idph.iowa.gov/BETS/Trauma/data-registry>

National Academy of Social Insurance-NASI 2009-2013 data:

[https://www.nasi.org/sites/default/files/research/NASI\\_Work\\_Comp\\_Year\\_2015.pdf](https://www.nasi.org/sites/default/files/research/NASI_Work_Comp_Year_2015.pdf)

NIOSH State Surveillance Program: [www.cdc.gov/niosh/oep/statesurv.html](http://www.cdc.gov/niosh/oep/statesurv.html)

Occupational Health Indicators, posted on the Council of State and Territorial Epidemiologists website: [www.cste.org/group/OHIndicators](http://www.cste.org/group/OHIndicators)

University of Iowa IPRC Burden of Injury County Level Data: [www.public-health.uiowa.edu/iprc/resources/burden-of-injury-in-ia/](http://www.public-health.uiowa.edu/iprc/resources/burden-of-injury-in-ia/)

Links were active as of the date of document revision. If you experience an inactive link, please report it to the IDPH OHSSP: [kathy.leinenkugel@idph.iowa.gov](mailto:kathy.leinenkugel@idph.iowa.gov) or 515-281-4930.

## Appendix 5: Glossary of Common Injury Data Terminology

**Age-adjusted rate (Direct Method):** A weighted average of the age-specific incidence or mortality rates from the targeted population(s) where the weights are the proportions of persons in the corresponding age groups of a standard population (Year 2000 U.S. population). Age-adjusted rates allow for comparisons of rates over time or between different populations.

**Age-specific rate:** The number of cases for a given period (e.g., 2009-20013) for a specific age group by the population for that age group for that time period.

**Cause of Death:** The disease or injury which set in motion the chain of physiological disturbances which produced death.

**Crude death rate or crude hospitalization rate:** The number of deaths or hospitalizations over a specified time period divided by the total population (per 100,000).

**E-Codes:** External Cause of Injury codes, developed by the World Health Organization (WHO), are a supplemental code for use with the International Classification of Diseases (ICD).

**Inpatient Hospital discharges:** Records from hospital patients discharged after admission.

**ICD-9-CM:** The International Classification of Diseases, 9th Revision, Clinical Modification codes were used in classifying diagnoses from hospital inpatient and ED visits (prior to October 2015).

**ICD-10-CM:** The International Classification of Diseases, 10th Revision, Clinical Modification codes were used in classifying causes of death from death certificates since 1999. U.S. hospitalization data coding was transitioned to ICD-10-CM in 2015.